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H.R. 3765, THE COMMERCIAL SPACE LAUNCH ACT AMENDMENTS

HEARINGS BEFORE THE SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS OF THE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY U.S. HOUSE OF REPRESENTATIVES ONE HUNDREDTH CONGRESS

SECOND SESSION

FEBRUARY 16, 17, 1988

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H.R. 3765, COMMERCIAL SPACE LAUNCH ACT AMENDMENTS

TUESDAY, FEBRUARY 16, 1988

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS,
Washington, DC.

The subcommittee met, pursuant to call, at 1:30 p.m., in Room 2318, Rayburn House Office Building, Hon. Bill Nelson (chairman of the subcommittee), presiding.

Mr. NELSON. The meeting will come to order.

I want to extend a warm welcome to our witnesses as we open this second session of the Congress, at this subcommittee's hearing on a new legislative initiative, H.R. 3765, the Commercial Space Launch Act Amendments.

Five months ago we had a hearing, two days of hearings, and the purpose of those hearings was to gain insight into the progress made toward developing a truly commercial launch industry. We found that over the course of one year after the determination of the Space Shuttle that it would no longer be available to commercial users that there were a number of interesting findings. And so let me relate to you and refresh your memory from what we learned on September the 15th and September the 17th.

We learned that America's launch providers had made significant investments in order to enter the world launch competition. We learned also that several companies had succeeded in signing up satellite customers for launches beginning in 1989, but that none of those were American companies. We learned that satellite customers could obtain neither cost quotes nor launch quotes from American launch providers. Why? Because the Government had not made a clear commitment to recognize commercial providers as a partner and a user of the national ranges.

We also learned that despite the passage of the Commercial Space Launch Act of '84, which consolidated authority over commercial space transportation into a single department, the Department of Transportation, a multi-agency space policy decision-making quagmire persisted, with each agency protecting its own turf.

We further learned that the Government's pronouncements of fostering this new industry were not being translated into workable, commercially reasonable agreements. Across-the-board, the Government's Model Range Use Agreement, which was the principal agreement setting forth the terms and conditions, that agree-

ment was denounced as unconscionable, by requiring the industry to assume all of the risk and potential liability of launch activities, even that resulting from the Government's own negligence.

And finally, we learned of a lack of confidence so great among those in our American satellite industry that some urged—get this. Some urged that they be granted access to the Soviet Proton for launch.

So, in essence, the Government was doing an abysmal job implementing space transportation policies despite their major consequences for the United States launch and satellite industries. The only detectable policy we have seen is a policy of neglect; that is, kick commercial users off the Shuttle and let everyone fend for themselves is the policy. These matters are, in my view, far too important to leave to chance. And although we have seen some encouraging signs of life in the ELV industry, there are also some very troubling signs that are just not being addressed.

This faulty implementation could threaten the very survival of this new launch industry and drive offshore the one pride and joy this Nation has in commercial space, the American satellite industry. And so clearly there is a need for legislation. A policy of neglect is a bad policy. And that is why I and 21 Members of Congress decided to introduce H.R. 3765 last December the 15th, to confront head on the persistent problems associated with the start-up of this new industry.

Now we are not going to dwell on the specific provisions in my opening statement, but let me say that the themes are not new. The bill follows the policy precedents established in public law for commercial use of the Space Shuttle. The result is a risk-sharing relationship between the Government and industry which is consistent with governmental responsibilities under law and international treaty. And the bill also recognizes for the first time the damaging impact of administration policy flip-flops which finally ended commercial access to the Space Shuttle.

The bill contains special incentives for those companies that had planned to launch on the Space Shuttle so long as they choose to launch American. Other provisions address the long-term competitiveness of an American launch industry in an increasingly competitive world marketplace. And, although this legislation provides the most reasonable solution into the problems as we currently see them, nothing—let me tell you, we filed this, we scrubbed it, we circulated it, we filed it December the 15th after we had circulated it, but nothing is set in concrete; this is a starting point.

And so the purpose of these hearings is to discuss these provisions in a fair and open manner, and I hope that our witnesses can take off our respective organizational hats, forget about turf for a moment, and reach some solutions that we can all live with. And so it's—I want everybody to know it's my intention that we're going to proceed with subcommittee mark-up on this legislation in the near future, and I urge all interested parties to submit comment to the subcommittee during the next month.

So we welcome our Administration witnesses today: Jack O'Brien, General Counsel to NASA; Courtney Stadd, the Director of Office of Commercial Space Transportation in DOT; and Charles Cook, Assistant Secretary of the Air Force for Space Programs.

And we will enter a statement by our ranking member, Mr. Walker.

[The prepared opening statement of Mr. Walker follows:]

OPENING REMARKS OF
REPRESENTATIVE ROBERT S. WALKER

REPUBLICAN VICE CHAIRMAN
SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS
U. S. HOUSE OF REPRESENTATIVES

February 16, 1988

Good afternoon, Mr. Chairman. Today we start the first of two important hearings to help set the course for our infant commercial space launch industry.

These hearings will help us establish exactly what modifications are needed to the Commercial Space Launch Act to ensure that we get this important national initiative of the ground.

Let me make the point that a commercially viable U. S. space launch industry is the critical corner-stone of a viable and competitive U. S. space industry.

We in the Congress have come to the conclusion that one of the major impediments to our evolving domestic space launch industry is the difficulty in getting sufficient insurance to cover the risks involved at a reasonable price.

Space transportation is an inherently risky business. Much of that risk can be minimized through range safety procedures, but there will always remain some element of risk. If a catastrophic accident should occur there is the clear potential for damage awards far in excess of available insurance.

The President and the Congress have both stated on many occasions that we need to foster a domestic ELV industry to support our national defense and to ensure American leadership in the space arena. In furthering that policy we need to develop a method of allocating the liability risks involved in space launch operations that will allow the industry to operate, and, at the same time, we need to find ways to minimize the risks to the government and the American taxpayer.

The Administration has suggested that these goals are best achieved through comprehensive tort reform legislation. There are many in the Congress who would support that position. However, tort reform is not within the jurisdiction of this Committee. In the absence of any indication that the Committee of jurisdiction is going to undertake any review of the question of tort reform, then we must look to other methods of achieving our goal through avenues which are within our jurisdiction.

Let me make one final point which I think is very important. I know that there has been some controversy within the Administration, and within the Congress, over the appropriate role of the Department of Transportation as the Executive Branch advocate for the commercial space launch industry. I want to reaffirm my personal support for DOT's advocacy position, and point out that Section 2 of the bill before us, H. R. 3765, endorses DOT's responsibility under the Commercial Space Launch Act to "encourage and facilitate

commercial space launches by the private sector, consistent with the space policies of the United States as established in public law..." It is my contention that there is a tremendous amount of private capital that will be attracted to support commercial activities in space once we get the government out of the activities that can be supported in the commercial marketplace. Without the efforts of NASA over the years we could have never developed the technology that is available today. But NASA has always been a R&D agency, and R&D agencies and commercialization efforts tend to be much like oil and water. We need to maintain that advocacy role, and I continue to support the Department of Transportation.

With that, Mr. Chairman, let me congratulate you for calling these hearings, and let us hear what the witnesses have to say.

Mr. NELSON. And so, gentlemen, if you will proceed. Mr. O'Brien? And may I say, you know my preference. Instead of you sitting there and reading to us something that's going to be entered in the record in its entirety, we would appreciate your, in your own words, giving it to us in a summary form. Thank you.

STATEMENTS OF JOHN E. O'BRIEN, GENERAL COUNSEL, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, WASHINGTON, DC; COURTNEY A. STADD, DIRECTOR, OFFICE OF COMMERCIAL SPACE TRANSPORTATION, U.S. DEPARTMENT OF TRANSPORTATION, WASHINGTON, DC; CHARLES W. COOK, PH.D., DEPUTY ASSISTANT SECRETARY, SPACE PLANS AND POLICY, DEPARTMENT OF THE AIR FORCE, THE PENTAGON, WASHINGTON, DC

Mr. O'BRIEN. Thank you, Mr. Chairman. I will submit my entire statement for the record and cover certain salient points which I think will be of interest to the subcommittee.

I don't know who is responsible for the seating arrangements here at this table, but I assume that by sitting in the middle I acquire some rights to divert questions to other members of this panel when they should arise later, and I appreciate that.

I am pleased to have this opportunity to share with you how NASA has approached risk sharing involving space endeavors as between itself and its users and partners, and I hope that this information will provide for you and the subcommittee a useful back-drop for your consideration of H.R. 3765.

As you are aware, NASA has utilized a number of different agreement formats in dealing with the private sector, with each format specifically tailored to balance the complementary needs and the goals of the Government and the private participant. One of the major balances in such agreements involves the basic sharing of risk between the parties, as it is perceived to potentially exist, in the implementation of a particular undertaking. Inherent in all the possible combinations of agreements is the question of who is willing to accept what risk in a given context, and how that is finally resolved in the future may well determine the pace at which commercial use of space will develop.

This, in turn, illuminates the problem of who are the risk-takers of last resort; that is to say, who pays when something goes wrong. Here we encounter the thorny issues of insurance capacity, cost and continuity, self-insurance, and, of course, indemnification. Commercial survivability may depend on how surgically precise the risks can be identified, accepted and absorbed. What I will try to do here today for you is to give you an overview of how risk is currently being shared between NASA and its commercial users and partners, how we see risk sharing for the Space Station, and how we are approaching the advent of commercial expendable launch vehicle services.

NASA's standard launch service agreement, or as it's referred to, the LSA, evolved over a very long period time and, of course, is oriented towards the use of the Space Shuttle as the transportation mode. Perhaps the area which has been the most controversial and difficult to work out is the sharing of liability risks between NASA

and its customers. A certain amount of innovation was required and solutions emerged over a long period of time.

What we are talking about here generally involves two basic areas of liability: damage to persons and property involved in Space Shuttle operations and, of course, third-party liability. With regard to damage to persons and property, NASA decided that in order to facilitate the use of the Space Shuttle and to simplify the allocation of risks a cross waiver policy would be put in place as a standard LSA provision. Under this policy NASA and all Shuttle users agree to a no fault, no subrogation, interparty waiver of liability, and I think you are familiar with that cross waiver policy. We have had it in place for quite a while. In effect, what it provides is that each participant in a mission agrees not to sue any other participant in the same mission for damage or loss of property that might occur.

The consequences of this cross waiver policy are substantial. The net effect is to eliminate the need for insurance against claims for damage caused by a user to any other participant on the same mission. Most importantly, it protects the user from the most costly of all potential liabilities whether insured or not, and that is damage to or loss of the Shuttle itself. Through this contractual device NASA has removed the most significant property damage issue from the equation.

The third-party liability area has been dealt with in an entirely different way, however. Every non-United States Government user of the Space Shuttle is obliged to obtain, at no cost to NASA, insurance which protects the user and the United States Government from any third-party liability arising out of the activities covered by the LSA. A paramount reason for this is one which you have alluded to already in your opening remarks, Mr. Chairman, and that is to satisfy U.S. commitments to the world community through the Outer Space Treaty and the convention on international liability for damage caused by space objects. We, of course, stand behind these obligations but we require protection for the United States Government as well.

The third-party insurance that we require is that which is obtainable in the world market at a reasonable premium, which is easy to say but not too easy to implement. In the early days of the Space Shuttle flights it had been our experience that the amount available was in the neighborhood of \$500 million per payload for a single payload launch, and a maximum of \$750 million for multiple launches of commercial payloads on a single mission. I, frankly, don't really know what might be available in the marketplace at the present time.

It is our policy to indemnify Shuttle users against third-party liability over and above the available insurance coverage pursuant to authority available to NASA in section 308 of the Space Act, which was added to the Act by the Congress in 1979. Unlike property insurance, which a user may elect to obtain or not obtain, NASA requires third-party liability insurance policies to be reviewed by NASA due to the potential international liability issue.

Mr. Chairman, in my prepared statement for the record I do cover other NASA agreements and similar arrangements that we have in them. I will not take time here to go through those.

Rather, I would like to move on and mention the Space Station for just a moment.

The current international negotiations between the United States, ESA, Japan and Canada also address the cross waiver and the third-party liability issues. The United States has sponsored a cross waiver approach whereby each partner waives its right to bring an action against any other partner for loss of or damage to property of a partner during protected space operations. This approach builds upon and somewhat expands the NASA cross waiver which we have utilized in Space Shuttle.

The basic concept is to remove from the liability picture any property damage suffered by one partner at the hands of another partner or partners. The concept surrounding liability of the partners to third parties is very simple. The partners have merely agreed to be liable in accordance with the International Liability Convention and appropriately consult with each other when necessary.

With regard to our approach to commercial launch services, one of our major involvements to date has been to authorize the private sector to operate expendable launch vehicles on a commercial basis utilizing NASA-acquired assets. For example, an agreement between NASA and the General Dynamics Corporation, which became effective early last year, does allow GD to use our Atlas-Centaur assets that we had acquired previously. Insofar as third-party risk allocation is concerned, NASA is not responsible or liable for any damage which arises out of General Dynamics' commercial Atlas-Centaur activities.

We do have requirements for property damage and third-party liability insurance to protect General Dynamics, the United States Government and the United States' contractors and subcontractors. As you are probably aware, one unresolved matter there requires the Department of Transportation to set the insurance limits, and they are in the process of doing that.

A second major involvement that we have with commercial launch services providers will be the actual purchase of launch services by NASA. We have not finalized the first such agreement yet; however, it is clear in the liability area that the United States will remain liable to the international community under international obligations, and that will be a source of continuing discussion between the Government and launch services providers.

On that score, Mr. Chairman, as you know, just the other day the Administration announced a 15-point commercial space initiative. As part of this initiative, the Administration will take steps to address the insurance concerns of the U.S. commercial launch industry, and Mr. Stadd, I believe, will cover this in a few moments.

Mr. Chairman, NASA has worked diligently over the years to allocate the risk of space flight in such a way as to facilitate access to outer space for commercial purposes and yet at the same time protect the interest of the United States and its taxpayers. This hasn't been easy. However, we believe we have been successful for the most part. We look forward to assisting the subcommittee and other executive agencies in refining allocation approaches as they affect relationships between the Federal Government and commercial concerns in the future.

Finally, Mr. Chairman, I would like to make several points regarding H.R. 3765. The primary thrust of the bill is to further facilitate commercial access to outer space, and NASA supports this objective. With regard to the means by which the bill would implement this objective, through amendments to the Commercial Space Launch Act, NASA defers to the Department of Transportation since it is their law to implement and administer.

Having said that, however, there are several matters in the bill that directly affect NASA and I would like to comment on those. Pursuant to section 5(a)(2) of the bill, the NASA Administrator, upon application of the owner of an eligible satellite, as defined elsewhere in the bill, is required to determine the amount such owner would have been required to pay for liability insurance for third-party claims for the launch of such satellite under the terms of an unperformed launch services agreement or a contract with NASA as of August 15, 1986.

Mr. Chairman, we simply don't know how to make such a calculation. Simulation of insurance market conditions after the fact is difficult at best and perhaps even impossible. The direct parties to an insurance purchase transaction are probably better able than anyone else to do this rather than NASA.

There are other matters of concern that we have in section 5, which are included in my statement; I will just not mention those at this time. But I would like to mention section 9 of the bill, which would require NASA to perform research into and develop certain technologies in support of commercial launch activities.

As you know, NASA is no stranger to technology development in support of the Civil Space Program and technology transfer to the private sector. We would envision continuing this traditional NASA role in support of commercial launch activities in accordance with the basic thrust of section 9.

Other sections of the bill, such as sections 6 and 7, would require NASA to work with the Departments of Transportation and Defense on various matters, and we would, of course, be pleased to do so when the time comes.

Mr. Chairman, that completes my prepared remarks, and I would be pleased to answer or divert any questions that you or other members may have.

Mr. NELSON. Thank you, Mr. O'Brien.

[The prepared statement of Mr. O'Brien follows:]

Hold for Release Until
Presented by Witness

SUBCOMMITTEE ON SPACE SCIENCE
AND APPLICATIONS
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY

Testimony of:
John E. O'Brien
General Counsel
NASA

Mr. Chairman and Members of the Subcommittee:

I am pleased to have this opportunity to share with you how NASA has approached sharing of the risks involved with space endeavors between itself and its users and partners. I hope that this information presents a useful backdrop for the Subcommittee's consideration of H.R. 3765, the "Commercial Space Launch Act Amendments of 1987."

As you are aware, NASA has utilized a number of different agreement formats in dealing with the private sector with each format specifically tailored to balance the complementary needs and goals of the government and the private participant. One of the major balances in such agreements involves the basic sharing of risk between the parties as it is perceived to potentially exist in the implementation of a particular undertaking.

Inherent in all the possible combinations of agreements is the question of who is willing to accept what risk in a given context. How that is finally resolved in the future may well determine the pace at which commercial use of space will develop. This, in turn, illuminates the problem of who are the "risk-takers of last resort," i.e., who pays when something goes wrong. Here we encounter the thorny issues of insurance capacity, cost, and continuity, self-insurance, and indemnification. Commercial survivability may depend upon how surgically precise the risks can be identified, accepted, and absorbed. What I will try and do here today is give an overview of how risk is currently being shared between NASA and its commercial users and partners, how we see risk sharing for the Space Station in the context of our current international negotiations, and, how we are approaching the advent of commercial Expendable Launch Vehicle (ELV) services.

Launch Services Agreements. NASA's standard launch services agreement, or LSA, evolved over a long period of time, and, of course, is oriented toward the use of the Space Shuttle as the transportation mode. Perhaps the area which has been the most controversial and difficult to work out is the sharing of liability risks between NASA and its customers. A certain amount of innovation was required and solutions emerged over a period of time. This generally involves two basic areas of liability: damage to persons and property involved in Space Shuttle operations; and, third party liability.

With regard to damage to persons and property, NASA decided that, in order to facilitate the use of the Space Shuttle and to simplify the allocation of risks, a cross-waiver policy would be put in place as a standard LSA provision. Under this policy, NASA and all Shuttle users agree to a no-fault, no-subrogation, inter-party waiver of liability. Pursuant to the cross-waiver, each party agrees not to bring a claim against or sue any other party and agrees to absorb the financial loss and any other consequences for damage it incurs to its own property and employees as a result of participation in Shuttle operations during "protected" Shuttle operations. This is irrespective of whether such damage is caused by NASA, a customer or user participating in the same operations, and regardless of whether the damage arises through negligence or otherwise. The inter-party waiver is also extended to contractors at every tier.

The consequences of this cross-waiver policy are substantial. The net effect is to eliminate the need for insurance against claims for damage caused by a user to any participant on the same Shuttle flight. Most importantly, it protects the user from the most costly of all potential liabilities, whether insured or not, i.e., damage to or loss of the Shuttle itself. Through this contractual device, NASA has removed the most significant property damage issue from the equation.

The third-party liability area has been dealt with in an entirely different way. Every non-United States Government user of the Space Shuttle is obliged to obtain, at no cost to NASA, insurance which protects the user and the United States Government from any third party liability arising out of the activities covered by the LSA. A paramount reason for this requirement is the United States commitment to the world community through the Outer Space Treaty and the Convention on International Liability for Damage Caused by Space Objects. We stand behind these obligations but we require protection for the U. S. Government as well.

The third-party insurance that we require is that which is obtainable in the world market at a reasonable premium. In the early days of Space Shuttle flights, it had been our experience

that the amount available was in the neighborhood of \$500 million per payload for a single payload launch and a maximum of \$750 million for multiple launches of commercial payloads on a single Shuttle mission. I don't really know what might be available at this time. It is our policy to indemnify Shuttle users against third party liability over and above the available insurance coverage pursuant to authority available to NASA contained in Section 308 of the Space Act of 1958 which was added to the Act in 1979. Unlike property insurance which a user may elect to obtain, or not obtain, NASA requires third-party liability insurance policies to be reviewed by NASA due to the potential international liability issue.

Mid-deck vs. Cargo Bay. We have developed another policy which draws a risk allocation line at the bulkhead between the Orbiter mid-deck area and the cargo bay. Our policy is to indemnify from the first dollar our mid-deck users against third-party liability on the assumption that the type of activities being carried out in that area are largely benign and of low-risk potential. We would, of course, make an exception to this policy should we conclude that a particular experiment or activity carried a high or significantly high-risk potential.

On the cargo bay side of the bulkhead we reverse our risk assumption from that applicable to the mid-deck, i.e., we assume that the nature of the payloads carried in the cargo bay are of a higher risk potential than those carried in the mid-deck area. Therefore, we apply our normal LSA third party liability policy which requires insurance first over and above which we would provide indemnification. There is one standard exception to this approach involving our Small Self-Contained Payloads carried in the cargo bay (sometimes referred to as "get-away specials"). These are small scientific research and development payloads, 200 pounds or less and five cubic feet or less, which are flown on a space-available basis in a NASA-supplied standard container. The sponsors of these small payloads are in many cases students, professors, academic institutions, and small businesses. Due to the nature of the sponsors and the nature of the payloads, NASA has elected to facilitate the scientific research offered by the capability by removing the requirement for insurance against third-party liability. Instead, NASA provides total indemnification for these payloads pursuant to section 308 of the Space Act.

Joint Endeavor Agreements. Another special type of activity which NASA engages in, having risk allocation issues, involves the Joint Endeavor Agreements to further the goal of commercial use of space. The Joint Endeavor Agreement, or JEA, is a cooperative arrangement whereby NASA and a domestic private party share common program objectives, program responsibilities, and financial risks. No funds change hands under a basic JEA; each party funds its own undertaking. Under

the JEA approach, the private party selects an experiment or technology demonstration which complies with a basic NASA objective, conducts the necessary ground investigation, and develops flight hardware at company expense. To incentivize the investment, NASA agrees to use its "best efforts" to provide free Space Shuttle flights provided, of course, that certain criteria are met such as technical merit, contribution to innovation, and acceptable business arrangements. The free flights are limited in number and are oriented toward providing a fair opportunity for the private party to demonstrate a commercial capability. Once a viable capability is demonstrated, the private party becomes a regular paying customer of the Shuttle if the activity is Shuttle unique.

NASA's approach to allocating risk in JEA's fits nicely within the policies I have already mentioned. The standard NASA cross-waiver applies and the approach to third-party liability depends upon which side of the crew compartment bulkhead the payload will be carried. As a general approach, if the JEA payload is in the Orbiter mid-deck, no insurance against third-party liability is required and NASA will provide total indemnification. If the payload is carried in the cargo bay, NASA will make a case by case assessment of the risk and determine whether some minimum amount of insurance or self-insurance is required over and above which NASA will provide indemnification. These arrangements are tailored to meet the unique characteristics of each JEA transaction.

The Space Station. The current international negotiations between the United States, the European Space Agency, Japan, and Canada also address the cross-waiver and third-party liability issues. The United States has sponsored a cross-waiver approach whereby each Partner waives its right to bring an action against any other Partner for loss of, or damage to, property of a Partner during "protected space operations." This approach builds upon and expands the NASA cross-waiver utilized in Space Shuttle flights. The basic concept is to remove from the liability picture any property damage suffered by one Partner at the hands of another Partner or Partners. Each Partner, in effect, becomes a self-insurer of its own property for damage arising out of "protected space operations" as defined in the proposed clause.

The concept surrounding the liability of the Partners to third parties is very simple. The Partners have merely agreed to be liable in accordance with the international Liability Convention and appropriately consult with each other when necessary.

Commercial Launch Services. One major NASA involvement to date with commercial launch services providers has been to authorize the private sector to operate expendable launch vehicles on a commercial basis utilizing NASA acquired assets.

For example, an agreement between NASA and the General Dynamics Corporation became effective early last year for private sector operation of the Atlas/Centaur ELV. Insofar as third party risk allocation is concerned, NASA is not responsible or liable for any damage which arises out of General Dynamics' commercial Atlas/Centaur activities.

There are requirements for property damage and third-party liability insurance which would protect General Dynamics, the United States Government, and United States Government contractors and subcontractors. One unresolved insurance matter is that the amount and terms of the required insurance must be determined by the Department of Transportation which is in the process of doing so.

A second major involvement of NASA with the commercial launch services providers will be the actual purchase of launch services by NASA. We have not finalized the first such agreement yet, however, it is clear that the United States will remain liable to the international community under international obligations. On February 11, 1988, the Administration announced a 15 point commercial space initiative. As part of this initiative, the Administration will take steps to address the insurance concerns of the U.S. Commercial Launch Industry. Consistent with the Administration's tort policy, the Administration will propose to Congress a \$200,000 cap on non-economic damage awards to third parties resulting from commercial launch accidents. In addition, the liability of commercial launch providers for damage to Government property resulting from a commercial launch accident will be administratively limited to the level required by the Department of Transportation. Below this level, the Government will waive its right to recover for damages to federal property where such damage is caused by Government willful misconduct or reckless disregard. Above this level, the Government will waive its right to recover for damage to federal property.

Mr. Chairman, NASA has worked diligently over the years to allocate the risk of space flight in such a way as to facilitate access to outer space for commercial purposes and yet, at the same time, protect the interests of the United States and its taxpayers. It hasn't been easy, however, we believe that we have been successful for the most part. We look forward to assisting the Subcommittee and other Executive Agencies in refining allocation approaches as they affect relationships between the federal government and commercial concerns in the future.

H.R. 3765. Finally, Mr. Chairman, I would like to make several points regarding H.R. 3765. The primary thrust of the Bill is to further facilitate commercial access to outer space and NASA supports this objective. With regard to the means by which the Bill would implement this objective, through

amendments to the Commercial Space Launch Act, NASA defers to the Department of Transportation since it is their law to implement and administer.

Having said that, however, there are several matters in the Bill that directly affect NASA and I would like to comment on those. Pursuant to Section 5(a)(2) of the Bill the NASA Administrator, upon application of the owner of an eligible satellite as defined elsewhere in the Bill, is required to "determine the amount such owner would have been required to pay for liability insurance for third party claims for the launch of such satellite under the terms of" an unperformed launch services agreement or contract with NASA as of August 15, 1986. Mr. Chairman, we simply don't know how to make such a calculation. Simulation of insurance market conditions after the fact is difficult at best and perhaps, even impossible. The direct parties to an insurance purchase transaction are probably better able than anyone else to do this rather than NASA.

Also, with regard to Section 5(b), consistent with the policy which removed a number of satellites from the Shuttle, a number of companies have signed or are pursuing launch service agreements with the private sector. I believe it would be an inappropriate role for the U.S. Government to control or sequence launches by the private sector under section 5(b). In addition, the Shuttle manifest was developed based upon Shuttle resources and schedules in contrast to private company resources and schedules.

Section 5(c) where the U.S. Government would not require payment for launch services and property is inconsistent with Administration policy and would place the U.S. Government into a role involving direct subsidies. Such an intent on the part of the U.S. would upset the delicate balance we are achieving in consultations with the Europeans to establish "fair rules of the road" for providers of launch services. These consultations, under the auspices of the United States Trade Representative could lead to negotiations if appropriate.

Section 9 of the Bill would require NASA to perform research into and develop certain technologies in support of commercial launch activities. As you know, NASA is no stranger to technology development in support of the civil space program and technology transfer to the private sector. We would envision continuing this traditional NASA role in support of commercial launch activities in accordance with the basic thrust of Section 9.

Other sections of the bill, such as Sections 6 and 7, would require NASA to work with the Departments of Transportation and Defense on various matters and we would, of course, be pleased to do so when the time comes. Furthermore,

Mr. Chairman, we would be pleased to work with Department representatives and the Subcommittee and Subcommittee staff to revise the Bill where necessary or desirable should you deem it advisable.

Mr. Chairman, that completes my prepared statement and I would be pleased to answer any questions you or other members may have.

Mr. NELSON. Thank you, Mr. O'Brien.

Mr. Stadd.

Mr. STADD. Thank you, Mr. Chairman. Of course, we have submitted our full text of our statement, and, in accordance with your instructions, I will summarize, and will attempt to summarize the summary that I have in front of me in the interest of time.

Mr. Chairman, and members of the subcommittee, on the day the White House released the new National Space Policy, the Department of Transportation announced issuance of a launch license to Conatec, a commercial sounding rocket firm which testified on its activities before this committee last fall. Conatec is precisely the kind of entrepreneurial operation, combined with the already established firms, which I think you all had in mind when you originally passed the Commercial Space Launch Act back in 1984, and Conatec's application is one of six being processed by OCST since my last appearance before this subcommittee. And we anticipate processing as many as 10 licensing requests this year, which is consistent with projections I've made to this committee over the past year.

In previous testimony, we predicted the emergence of turn-key arrangements, whereby a customer would pay a launch firm a fixed price for delivery of a satellite on orbit. The launch firm in this case arranges everything: insurance, launch sites, personnel required to accommodate the customer. The past several months have seen the inception of several such arrangements, the most notably the dramatic announcement that Martin Marietta and General Electric had entered into a joint marketing agreement offering substantial discounts to customers who buy a GE satellite and launch it on a commercial Titan. This agreement, we understand, covers as many as 15 satellites. So I, I mention that to indicate that we are seeing the emergence of an American spacecraft entering in agreements with American launch firms.

The '84 Commercial Space Launch Act assigned DOT responsibility for encouraging and guiding this dynamic new industry. As the committee has discovered along with us, this has proven to be a most challenging assignment.

First, although the Federal Government has been launching rockets for 30 years, it never had to establish a regulatory framework for overseeing private space transportation systems. As hearings before this committee have shown time and again, this new role for Government has given rise to a number of complex policy issues. The proposed amendments, Mr. Chairman, are clearly a response to this situation.

Operating launch programs and guiding a commercial launch industry are two fundamentally different tasks for the Federal Government. This committee has recognized the need for DOT to develop the research base needed to issue appropriate regulatory policies and requirements, and the committee has been supportive of our modest budget request in this regard but I have got to note that we are tackling our lead agency responsibilities without ever having been funded at the level requested by the President or even this committee. For example, last year the Administration requested and this committee authorized \$4.5 million for the office. We have appropriated something on the order of \$1.8 million.

Well, in spite of budgetary constraints, we are managing, with the cooperation of my colleagues from NASA and Air Force, to remove many of the barriers facing this industry. We have established licensing policies and procedures which ensure that all proposals to conduct commercial launch activities receive prompt and thorough consideration, and so far those six reviews I mentioned to you, Mr. Chairman, have been, I think, handled in the spirit of the Act.

We have conducted extensive analyses of the risks associated with launches and various methodologies for setting appropriate insurance requirements. We have completed assessments of the environmental effects associated with commercial launch operations, and have worked to devise contractual arrangements that will allow firms access to Government launch support services on reasonable terms.

Mr. Chairman, you will recall that through our COMSTAC report last year we brought to this committee's attention industry's concerns regarding the terms and conditions associated with access to the national ranges, and as you will remember, several of the witnesses—as you know, several of the witnesses you will be hearing from are members of our COMSTAC.

Over the past year, this advisory group has been an invaluable source of guidance to the Department as we have sought solutions to industry concerns. We have been active on other fronts—working with the United States Trade Representative on international trade and launch services, and working closely with States that are expressing an interest in building commercial space ports, to name only two.

Because a major part of the committee's proposed amendments deal with the space liability problem, I would like to address the Administration's proposed approach to this issue. Although we lack the statutory authority needed to remedy the problem of unlimited liability for third-party damage, the Administration is formulating, and the Department will soon submit, legislation that is intended to limit launch firms' total liability exposure. The Administration has also decided to take additional actions to be implemented through DOT's regulatory authority under the 1984 Commercial Space Launch Act to resolve outstanding liability issues in the area of Government property damage. I will briefly summarize these three actions and explain how they are to be implemented.

First, with respect to unlimited liability for third-party damage, the Administration will propose legislation to limit an individual's recovery for so-called non-economic damages, that is, for damages for pain and suffering and punitive damages, to \$200,000. Awards in these damage categories, which are often imprecise and tend to be subjectively measured, have exacerbated the current liability crisis. We are not proposing, however, to limit recovery for so-called direct damages. We believe injured parties should continue to receive compensation for damages they actually sustain.

Secondly, in cases involving damage to Government property liability will be limited, through regulations to be issued by the Department, to the amount of coverage the Department requires. Above that level the United States Government will waive its right to recover for damages it sustains.

Third, the Administration has also decided to adopt, through departmental regulation, a more equitable sharing of the risks associated with commercial launch operations at Government ranges. We have decided that when property loss or personal injury results from Government's own willful misconduct or its own reckless actions the Government will not make claims against the insurance which launch firms must carry to cover Government property loss or personal injury.

In summary, the Administration is currently drafting appropriate legislation to cap third-party liability and the Department is engaged in a rulemaking process that will implement the policies affecting liability for Government property loss. In that rulemaking we plan to specify the factors the Department will consider in setting insurance requirements. Once published, the proposed rule will be followed by a comment period during which, obviously, Congress, industry and the public will have the chance to make their views known.

We believe that together Congress and the Administration can move expeditiously in the next few months to resolve the more difficult aspects of the liability issue. We believe this could be accomplished through regulation and by enacting legislation along the lines I've described.

With your permission, Mr. Chairman, a few additional comments on some other key provisions in the amendments. I believe the committee is already aware of our view that the proposed amendments should retain the original language calling on the Department to promote this industry. In September 1986 the committee reaffirmed the need for this language. If anything, I would suggest that development since then have underscored the wisdom of that original decision.

Secondly, regarding the section entitled "Launch Incentives for Eligible Satellites," I concur with my colleague from NASA's views concerning the problems with implementing it. Furthermore, given the number of foreign satellite owners which would stand to benefit, the U.S. might find itself in the rather anomalous position of providing assistance to foreign satellite operators.

Third, section 3(a) addresses application of direct costs. Although we commend this effort to clarify the definition of direct costs, we believe it would serve to only confuse the working definitions developed by NASA and the Air Force in cooperation with the industry to date.

Section 8 calls on the Government to explore establishing principles for fair international competition in commercial space activities. As noted earlier in my statement, the Department is actively supporting the USTR in discussions with the Europeans in exploring the feasibility of establishing fair trade practices in international launch services.

Mr. Chairman, this committee originally proposed the Commercial Space Launch Act in order to foster an American commercial launch industry. Well, that visionary goal of yours is becoming a reality and, just as we have in the past, we look forward to working closely with you and your colleagues to address in an intelligent and timely manner the outstanding issues associated with this

transition from Government dominated to private sector ownership of the Nation's launch systems.

Thank you, sir, for your time and attention.

[The prepared statement of Mr. Stadd follows:]

Statement of

Courtney A. Stadd
Director, Office of Commercial Space Transportation
U.S. Department of Transportation

before the

Subcommittee on Space Science and Applications
Committee on Science, Space and Technology
U.S. House of Representatives

February 16, 1988

MR. CHAIRMAN, MEMBERS OF THE SUBCOMMITTEE, THANK YOU FOR GIVING ME THIS OPPORTUNITY TO ADDRESS THE ISSUES FACING AMERICA'S COMMERCIAL SPACE TRANSPORTATION INDUSTRY TODAY.

AMERICA IS THE ONLY NATION IN THE WORLD WITH A FULL COMPLEMENT OF INDEPENDENT, FOR-PROFIT FIRMS THAT ARE AGGRESSIVELY MARKETING LAUNCH SERVICES TO A WIDE RANGE OF DOMESTIC AND INTERNATIONAL CUSTOMERS. IN THE LAST YEAR, WE PROCESSED SIX COMPLETE OR PARTIAL LICENSE APPLICATIONS FROM THREE FIRMS. AND JUST THREE WEEKS AGO, MY OFFICE ISSUED OUR FIRST LAUNCH LICENSE. IT WAS ISSUED TO CONATEC, INC. AN ENTREPRENEURIAL ROCKET FIRM WITH HEADQUARTERS HERE IN THE WASHINGTON AREA. CONATEC IS ONE EXAMPLE OF THE KIND OF ENTREPRENEURIAL OPERATION THE COMMERCIAL SPACE LAUNCH ACT HOPED TO ENCOURAGE WHEN IT WAS ENACTED THREE AND A HALF YEARS AGO.

THE FIRMS THAT HAVE COME FORWARD WITH APPLICATIONS REPRESENT WHAT IS REALLY JUST THE TIP OF THE ICEBERG. BENEATH THE SURFACE IS A COMBINED CORPORATE INVESTMENT THAT NOW TOTALS SOME \$400 MIL-

LION. BY THE END OF 1987, INDUSTRY REPORTED THAT THIS INVESTMENT HAD YIELDED MORE THAN \$500 MILLION DOLLARS WORTH OF FIRM COMMERCIAL LAUNCH CONTRACTS. RIGHT NOW, THE RETURN ON THAT INVESTMENT IS APPROACHING TWO TO ONE: AMERICA'S THREE MAJOR AEROSPACE CORPORATIONS HAVE CONTRACTS TO LAUNCH 13 PAYLOADS, WORTH A TOTAL OF APPROXIMATELY \$700 MILLION. TEN OF THESE ARE FOREIGN PAYLOADS, WHICH WILL CONTRIBUTE TO IMPROVING OUR BALANCE OF TRADE. IN ADDITION TO THIS REVENUE, THE "BIG THREE" AEROSPACE MANUFACTURERS HAVE ESTIMATED THAT THEIR COMBINED LAUNCH BUSINESS INITIATIVES WILL ADD SOME 8,000 NEW JOBS TO THE ECONOMY, AND THIS IS WITHOUT THE DIRECT AND INDIRECT JOBS THAT COULD BE ADDED ONCE THE ENTREPRENEURIAL START-UP FIRMS -- LIKE CONATEC -- BEGIN SELLING LAUNCH SERVICES.

OF THOSE 13 PAYLOADS, THREE ARE U.S. GOVERNMENT SATELLITES. PRESIDENT REAGAN HAS DIRECTED ALL AGENCIES TO COOPERATE IN SUPPORTING COMMERCIAL SPACE ENTERPRISE -- PARTICULARLY NASA, AND THE DEPARTMENTS OF DEFENSE, COMMERCE AND TRANSPORTATION. HE RECOGNIZES THAT GOVERNMENT AGENCIES MUST WORK EFFECTIVELY WITH EACH OTHER AND WITH INDUSTRY TO DEVISE MEASURES THAT WILL FOSTER THE GROWTH OF COMMERCIAL SPACE SERVICES AND INDUSTRIES.

IN OUR ROLE AS FACILITATOR OF AMERICA'S COMMERCIAL LAUNCH INDUSTRY, ONE OF THE DEPARTMENT'S GOALS IS TO HELP GOVERNMENT LEARN HOW TO BE A "BETTER" CUSTOMER. GOVERNMENT IS A BETTER CUSTOMER WHEN IT CAN BUY THE PRODUCTS AND SERVICES IT NEEDS MORE ECONOMICALLY THAN IT CAN UNDER TRADITIONAL PROCUREMENT PRACTICES. CONSIDER, FOR EXAMPLE, THE POTENTIAL SAVING TO OUR GOVERNMENT WHEN

IT BUYS LAUNCH SERVICES COMMERCIALY RATHER THAN BUYING THEM IN THE TRADITIONAL MANNER: GENERAL DYNAMICS IS REPORTEDLY SELLING ITS COMMERCIAL ATLAS CENTAUR FOR ABOUT \$59 MILLION. IN 1985, THE FIRM SOLD THAT SAME VEHICLE TO THE U.S. NAVY FOR \$80 MILLION, ABOUT 26 PERCENT MORE. ONE REASON FOR THE APPRECIABLE PRICE DIFFERENCE IS THE ENORMOUS AMOUNT OF DOCUMENTATION GOVERNMENT REQUIRES OF ITS CONTRACTORS AND WHICH CONTRACTORS MUST THEN BUILD INTO THEIR PRICING STRUCTURES.

THE DEPARTMENT DOES NOT FORESEE A LAUNCH INDUSTRY WHOSE SURVIVAL DEPENDS SOLELY UPON GOVERNMENT BUYS, WHETHER OF COMMERCIAL LAUNCH SERVICES OR DIRECT PROCUREMENT OF LAUNCH VEHICLES. THE DEPARTMENT OF TRANSPORTATION IS ORGANIZING ITSELF FOR A COMMERCIAL LAUNCH INDUSTRY THAT TRANSPORTS CARGO TO SPACE NOT UNLIKE OUR TRUCKING, RAIL OR AVIATION INDUSTRIES TRANSPORT CARGO HERE ON EARTH. BECAUSE OF THE CAPITAL-INTENSIVE NATURE OF SPACE TRANSPORTATION, HOWEVER, INNOVATIONS IN BOTH TECHNOLOGY AND BUSINESS PRACTICES ARE NEEDED. ONE SUCH INNOVATION SEEMS ALREADY TO HAVE ENTERED PRACTICE, AND THAT IS THE TURNKEY ARRANGEMENT, UNDER WHICH A SATELLITE CUSTOMER PAYS A LAUNCH FIRM A FIXED AMOUNT TO HAVE HIS SATELLITE DELIVERED TO ORBIT. THE LAUNCH COMPANY THEN ARRANGES EVERYTHING -- INSURANCE, LAUNCH SITES, PERSONNEL -- REQUIRED TO ACCOMMODATE THAT CUSTOMER. ONE OF MARTIN MARIETTA'S EARLIEST COMMERCIAL CONTRACTS WAS A TURNKEY ARRANGEMENT WITH A DOMESTIC SATELLITE MANUFACTURER TO LAUNCH A BRITISH COMMUNICATIONS SATELLITE. MARTIN MARIETTA HAS FORMED A SIMILAR TYPE OF ARRANGEMENT WITH GENERAL ELECTRIC, UNDER WHICH THE FIRMS WILL SELL TELE-

COMMUNICATIONS SERVICES. THEY WILL OFFER SUBSTANTIAL DISCOUNTS TO CUSTOMERS WHO BUY A G.E.-BUILT SATELLITE AND LAUNCH IT ON A TITAN ROCKET. THE MARTIN MARIETTA-G.E. AGREEMENT CALLS FOR 15 SATELLITES TO BE LAUNCHED.

THE 1984 COMMERCIAL SPACE LAUNCH ACT, WHICH GAVE THE DEPARTMENT OF TRANSPORTATION THE LEAD IN FACILITATING THE KIND OF COMMERCIAL GROWTH I HAVE JUST DESCRIBED, ALSO GAVE US LEAD RESPONSIBILITY TO REGULATE COMMERCIAL LAUNCH ACTIVITIES SO THAT THEY ARE CONDUCTED SAFELY AND RESPONSIBLY. THIS HAS BEEN A CHALLENGING ASSIGNMENT IN MANY WAYS:

FIRST, ALTHOUGH AMERICA HAS BEEN LAUNCHING ROCKETS FOR 30 YEARS, IT HAS NEVER HAD TO DEVISE A FRAMEWORK FOR INTERACTING WITH PRIVATE PROVIDERS OF SPACE TRANSPORTATION SERVICES. OPERATING LAUNCH PROGRAMS AND GUIDING A COMMERCIAL LAUNCH INDUSTRY ARE TWO FUNDAMENTALLY DIFFERENT TASKS FOR THE FEDERAL GOVERNMENT. OUR TASK HAS INVOLVED REASSESSING THE TRADITIONAL GOVERNMENT-INDUSTRY RELATIONSHIP IN THIS AREA, AS WELL AS GOVERNMENT'S TRADITIONAL ROLE IN SPACE ACTIVITIES. MOST IMPORTANT, IT HAS MEANT ESTABLISHING THE ANALYTICAL UNDERPINNINGS FOR APPROPRIATE REGULATORY POLICIES AND REQUIREMENTS. IN LINE WITH THIS ADMINISTRATION'S REGULATORY REFORM POLICIES, OUR INTENT HAS BEEN TO REGULATE THIS NEW INDUSTRY ONLY AS MUCH AS NECESSARY TO ENSURE THAT LAUNCH ACTIVITIES ARE CONDUCTED SAFETY AND RESPONSIBLY. THUS, OUR TASK IS AND WILL CONTINUE TO BE UNIQUELY CHALLENGING. IT IS ALSO ONE WE HAVE BEEN PURSUING WITHOUT EVER HAVING BEEN FUNDED AT THE LEVEL

REQUESTED BY THE PRESIDENT OR EVEN AT THE LEVEL AUTHORIZED BY CONGRESS.

IN SPITE OF THESE FINANCIAL CONSTRAINTS, THE DEPARTMENT HAS STILL MANAGED TO REMOVE MANY OF THE BARRIERS THAT THE COMMERCIAL LAUNCH INDUSTRY FACED. OUR ACTIVITIES TO CLEAR A PATH FOR THIS INDUSTRY HAVE INCLUDED: LICENSING POLICIES AND PROCEDURES WHICH ENSURE THAT ALL PROPOSALS TO CONDUCT COMMERCIAL LAUNCH ACTIVITIES RECEIVE PROMPT, WELL-DEFINED REVIEWS; EXTENSIVE ANALYSIS OF THE RISKS ASSOCIATED WITH LAUNCHES AND OF THE VARIOUS METHODOLOGIES FOR SETTING APPROPRIATE INSURANCE REQUIREMENTS; COMPREHENSIVE ASSESSMENTS OF THE ENVIRONMENTAL EFFECTS ASSOCIATED WITH COMMERCIAL LAUNCH ACTIVITIES; AND DEVELOPING CONTRACTUAL ARRANGEMENTS THAT WILL ALLOW FIRMS ACCESS TO GOVERNMENT LAUNCH SUPPORT SERVICES ON REASONABLE TERMS. WE ALSO BEEN ACTIVE ON OTHER FRONTS: WORKING WITH THE UNITED STATES TRADE REPRESENTATIVE ON INTERNATIONAL TRADE IN LAUNCH SERVICES, AND CONSULTING WITH STATES THAT HAVE EXPRESSED INTEREST IN BUILDING COMMERCIAL SPACEPORTS.

BUT, AS THIS SUBCOMMITTEE AND BILL H.R. 3765 RECOGNIZE, MORE CAN BE DONE TO FACILITATE COMMERCIAL ENTERPRISE. TWO AREAS BEING PURSUED BY THE DEPARTMENT ARE GOVERNMENT PROCUREMENT PRACTICES AND INSURANCE-RELATED MATTERS; SPECIFICALLY, ISSUES ASSOCIATED WITH THE ALLOCATION OF RISK FOR COMMERCIAL LAUNCH ACTIVITIES. THE DEPARTMENT OF TRANSPORTATION IS WORKING WITH INDUSTRY AND VARIOUS EXECUTIVE BRANCH AGENCIES TO FIND A WAY FOR THE GOVERNMENT TO ACT MORE LIKE A COMMERCIAL CUSTOMER WHEN BUYING LAUNCH SERVICES.

LAST THURSDAY, FEBRUARY 11, THE ADMINISTRATION ANNOUNCED A 15-POINT COMMERCIAL SPACE INITIATIVE INCLUDING THREE ACTIONS IT WILL TAKE TO ALLEVIATE THE MOST CRITICAL ASPECTS OF THE OVERALL SPACE LIABILITY PROBLEM. ALTHOUGH WE LACK THE STATUTORY AUTHORITY NEEDED TO REMEDY THE PROBLEM OF UNLIMITED LIABILITY FOR THIRD-PARTY DAMAGE, THE ADMINISTRATION IS FORMULATING, AND THE DEPARTMENT WILL SOON SUBMIT, LEGISLATION THAT IS INTENDED TO LIMIT LAUNCH FIRMS' TOTAL LIABILITY EXPOSURE. THE ADMINISTRATION HAS ALSO DECIDED TO TAKE ADDITIONAL ACTIONS, TO BE IMPLEMENTED THROUGH THE REGULATORY AUTHORITY OF THE DEPARTMENT OF TRANSPORTATION UNDER THE COMMERCIAL SPACE LAUNCH ACT, TO RESOLVE OUTSTANDING LIABILITY ISSUES IN THE AREA OF GOVERNMENT PROPERTY DAMAGE. WITH YOUR PERMISSION, I WOULD LIKE TO BRIEFLY SUMMARIZE THESE THREE ACTIONS AND EXPLAIN HOW THEY ARE TO BE IMPLEMENTED.

(1) WITH RESPECT TO UNLIMITED LIABILITY FOR THIRD-PARTY DAMAGE, THE ADMINISTRATION WILL PROPOSE LEGISLATION TO LIMIT AN INDIVIDUAL'S RECOVERY FOR SO-CALLED "NON-ECONOMIC" DAMAGES -- FOR EXAMPLE, DAMAGES FOR PAIN AND SUFFERING, AND PUNITIVE OR EXEMPLARY DAMAGES -- TO \$200,000. AWARDS IN THESE DAMAGE CATEGORIES, WHICH ARE OFTEN IMPRECISE AND TEND TO BE SUBJECTIVELY MEASURED, HAVE EXACERBATED THE CURRENT LIABILITY CRISIS. WE ARE NOT PROPOSING, HOWEVER, TO LIMIT RECOVERY FOR SO-CALLED "DIRECT" DAMAGES. WE BELIEVE INJURED PARTIES SHOULD CONTINUE TO RECEIVE COMPENSATION FOR DAMAGES THEY ACTUALLY SUSTAIN.

(2) IN CASES INVOLVING DAMAGE TO GOVERNMENT PROPERTY, LIABILITY WILL BE LIMITED, THROUGH REGULATIONS TO BE ISSUED BY THE DEPARTMENT, TO THE AMOUNT OF COVERAGE DOT REQUIRES. ABOVE THAT LEVEL, GOVERNMENT WILL WAIVE ITS RIGHT TO RECOVER FOR DAMAGES IT SUSTAINS.

(3) THE ADMINISTRATION HAS ALSO DECIDED TO ADOPT, THROUGH DOT REGULATION, A MORE EQUITABLE SHARING OF THE RISKS ASSOCIATED WITH COMMERCIAL LAUNCH OPERATIONS AT GOVERNMENT RANGES. WE HAVE DECIDED THAT, WHEN PROPERTY LOSS OR PERSONAL INJURY RESULTS FROM GOVERNMENT'S OWN WILLFUL MISCONDUCT OR ITS OWN RECKLESS ACTIONS, THE GOVERNMENT WILL NOT MAKE CLAIMS AGAINST THE INSURANCE WHICH LAUNCH FIRMS MUST CARRY TO PROTECT AGAINST GOVERNMENT PROPERTY LOSS OR PERSONAL INJURY.

IN SUMMARY, THE ADMINISTRATION IS CURRENTLY DRAFTING APPROPRIATE LEGISLATION TO CAP THIRD-PARTY LIABILITY, AND THE DEPARTMENT IS ENGAGED IN A RULEMAKING PROCESS THAT WILL IMPLEMENT THE POLICIES AFFECTING LIABILITY FOR GOVERNMENT PROPERTY DAMAGE. IN THAT RULEMAKING WE PLAN TO SPECIFY THE FACTORS THE DEPARTMENT WILL CONSIDER IN SETTING INSURANCE REQUIREMENTS. ONCE PUBLISHED, THE PROPOSED RULE WILL BE FOLLOWED BY A COMMENT PERIOD DURING WHICH MEMBERS OF CONGRESS, INDUSTRY AND THE PUBLIC WILL HAVE THE OPPORTUNITY TO MAKE THEIR POSITIONS KNOWN.

WE BELIEVE THAT TOGETHER, CONGRESS AND THE ADMINISTRATION CAN MOVE EXPEDITIOUSLY IN THE NEXT FEW MONTHS TO RESOLVE THE MORE DIP-

FICULT ASPECTS OF THE LIABILITY ISSUE. WE BELIEVE THIS CAN BE ACCOMPLISHED THROUGH REGULATION AND BY ENACTING LEGISLATION ALONG THE LINES I HAVE DESCRIBED.

THANK YOU.

Mr. NELSON. Thank you, Mr. Stadd.

Dr. Cook?

Dr. COOK. Thank you, Mr. Chairman, and members of the committee. It's a pleasure to be here with you today to have an opportunity to discuss where we've been and where we're going with regard to supporting the United States commercial space launch industry. You've heard from NASA and you've heard from the Department of Transportation. I'll be as brief as possible, but I have some comments that I feel are very important to be made.

Last September, the Air Force testified before this committee. At that time we described the progress that the Air Force has made toward implementing the Commercial Space Launch Act. We told you of the Model Range Agreement, which is the implementing mechanism we developed jointly with NASA and the Department of Transportation and Commerce, to provide Government launch service support to the private industry. We also described the positive benefits that a healthy private launch industry accrues for the national defense and noted a reciprocal example with the United States Air Force procurement of Delta II launch systems encouraged and facilitated the McDonnell Douglas Corporation to compete in the commercial space launch market.

Since September the executive agencies have made great progress at both the policy and at the technical levels. Within the Administration we have dealt effectively with the leadership issue. The new National Space Policy clearly establishes the policy framework within which a commercial space launch industry can flourish. That policy now recognizes a commercial space sector in addition to the national security and the Government's civil space sectors. It also establishes guidance and Government space activities so as to avoid actions that preclude or deter U.S. commercial endeavors.

Further, through the Economic Policy Council—the EPC—all involved Government agencies have participated in developing initiatives which, while not providing subsidies, do encourage industry development. Two of these initiatives which are particularly relevant to the Commercial Space Launch Act are the insurance relief for launch providers, that's been outlined by Mr. Stadd, and the consultation on the development of private launch ranges. With regard to the latter, the Administration will consult with the private sector on the potential construction of commercial launch range facilities separate from Federal facilities and the use of such facilities by the Federal Government. In fact, we have had several meetings on this subject already.

Another interagency activity in which the Air Force has been active and a positive force is U.S. Trade Representative led discussions with the European Space Agency. We believe these talks are providing both informative and productive results. They hold real promise for establishing an equitable long-term environment for free and fair space launch competition. If you will, it's a leveling of the international playing field what we're trying to accomplish. A key to the success of these discussions has been the Air Force briefings on procedures for implementing the Model Agreement and our ability to demonstrate that direct cost pricing policies do not constitute Government subsidies.

Beyond these policy forums, the Air Force working with industry has made substantial progress on the technical level. E-Prime, Martin Marietta and General Dynamics have all signed actual commercial launch service agreements which are tailored versions of the Model Agreement. These have been signed with the Air Force. We anticipate that McDonnell Douglas will also sign within the next few weeks.

Further, the Model has become more realistically a living document. Working with industry, we have identified areas where changes in the contract were appropriate. As such, in these areas the environmental protection responsibilities, provision of contract administration services such as quality assurance support and limits of corporate liability for launch failures caused by the willful misconduct or reckless disregard of Government employees. In each of these areas we have made such changes.

We have also undertaken a study to determine the value of Government property that could be at risk in the case of an accident during the various stages of commercial space launch activities. This is a complicated analysis because it must address for each vehicle and launch azimuth both fixed costs such as the value of buildings and the variable costs such as the value of satellites or rockets or other equipment or material located in those buildings that could be at risk in the event of an accident.

Once complete this data will provide the basis for consultation with the Department of Transportation on appropriate insurance levels. In this regard, the Air Force and the Department of Transportation have begun formalizing the consultative process and we will soon establish a permanent steering committee to ensure coordination and cooperation.

Within the Air Force we have established single commercial space points of contact. My office has been designated the Air Force focal point for policy management in interagency matters. Air Force Systems Command and Air Force Space Division have also established single points of contact for technical management and program implementation.

Quickly—other recent accomplishments include the following:

Commercial launch schedules have been incorporated into the Government ELV launch planning and manifest. Both Martin and GD scheduling have been included.

The Air Force has taken action to make launch property available for purchase by interested commercial launch users. An example, the Thor engines, they were working with McDC.

The Air Force has developed a policy on direct cost which ensures that the Government facilitates but does not subsidize the emerging industry.

The Air Force has been working with Martin Marietta to modify Launch Complex 40 at Cape Canaveral for dual commercial Titan and Titan IV use. Martin Marietta is paying their fair share of the modification costs and we are working construction timetables to ensure that the commercial space launch schedules are not adversely impacted. Also, discussions are ongoing with McDonnell Douglas to optimize the use of Launch Complex 17 at Cape Canaveral for commercial and Government launches, and we are prepared to assist other launch firms in similar ways.

One additional accomplishment is the Medium Launch Vehicle II competition. This competitive Air Force acquisition, which is currently underway, embodies many commercial principles. It greatly reduces the technical oversight and documentation requirements and places incentives on successful launch operations. We believe this approach makes good sense both for the industry and for the United States Government.

Let me now turn to the proposed amendment to the Commercial Space Act. Let me say something up front first. We feel that we have worked hard to facilitate the commercial interests within the intent of commercialization. Our direction tells us to do this on a non-interference basis within existing laws. We think we have worked well within that, and in that context we have reviewed the document very carefully and we have a number of concerns.

First, in the area of insurance, the draft legislation provides detailed instructions on insurance levels and risk allocation. While the Air Force fully supports the intent of the proposal to limit the exposure of commercial launch firms to a quantifiable and insurable level, we believe that specification of dollar limits on liability and the provisions for cross waivers are unnecessary constraints. In the long term, lack of Government flexibility in this regard we feel will work to the detriment of the industry.

Second, the section of the draft legislation which deals with launch incentives for eligible satellites appears to us to have unintended consequences. We understand the intent of the drafters of the legislation was to redress the problems created for commercial satellites previously manifested on the Space Shuttle. NASA estimates that there are 22 possible eligible satellites. Of these, one has been launched and approximately 7 have committed themselves to foreign launch vehicles, leaving 14 satellites which could be licensed by the Department of Transportation for domestic ELV launches and qualify for preferential treatment. Of these 14, 3 are foreign, 4 are international, and only 7 are domestic.

If the draft legislation were implemented, the U.S. Government would be giving preferential treatment to these satellites, foreign as well as domestic, in contrast to those who will fly elsewhere. Additionally, launch priority could adversely affect other domestic satellites and the provision of a payload processing at taxpayer expense could have a serious adverse effect on the commercial entity presently offering payload processing services.

Further, the satellite owners who are manifested on the Shuttle but have subsequently committed to a foreign launch vehicle would be placed at a competitive disadvantage. This seems unfair to us, because for the most part these were the satellites which were ready for launch at the time rather than just planned before the Shuttle—before the Shuttle accident. In other words, the ones that are most affected are comparatively the most competitively disadvantaged.

Another concern associated with this provision relates to funding. The draft legislation would require the Air Force to provide launch support free of cost for the launch providers of eligible satellites. The Air Force has no appropriation for providing such services. An ambiguity in that regard are the words "provision of

launch property." We are unsure what that provision is intended to indicate.

Third, the pre-emption provisions in the draft legislation may have similarly unintended consequences. First, let me clearly state that it is the intent of the Air Force to fully utilize the space launch ranges which we operate in the most efficient and overall productive manner possible, first by meeting U.S. Government launch needs and then maximizing the launch utilization for commercial launch enterprises. We are working closely with the launch prospective companies to ensure their capability to perform commercially viable long-term planning.

However, there are aspects beyond our control which may impact commercial launch schedules. It is not clear how these impacts would be interpreted in the context of the words "not unreasonably pre-empted except for imperative national need." Those words are subject to considerable interpretation. With so many factors beyond our control that can impact schedules, a requirement for the Government to pay liquidated damages for schedule delays or pre-emptions would on the contrary it would seem to us incentivize the Air Force to be very conservative in the allocation of launch dates. Thus, legislation intended to aid industry could in the long run serve as a limitation on its growth and profitability. In other words, if we should schedule everything so that we never have to pre-empt, there would be many less commercial opportunities.

If legislation is judged to be necessary, our recommendation is that a "sense of the Congress" statement that the Air Force make a best effort to minimize schedule disruptions would better serve the purpose and the intent of the legislation than an imposition of financial penalties which would inevitably affect the Air Force productivity and, ultimately, much of it would fall upon the taxpayers.

Fourth, while it is difficult to object to yet another study, the area of manifesting is one where we have made substantial progress. We and NASA have had considerable recent experience in this regard and in which we doubt that a congressionally directed study could shed new light. The Air Force has worked with each space launch company as we entered into agreements to establish launch statements—launch schedules and launch rates, some that go well down stream. We continue to work with these corporations as their schedules change, and our feedback from the industry has been positive and supportive of the procedures we have established. A study could well divert our limited resources from this ongoing productive progress.

Now there are 5 additional features of the proposed legislation which I would like to comment on briefly. First, the redefinition of "direct cost" is confusing and seems to blur the distinction in our minds between direct and marginal costs. We have learned to operate under the existing definition and believe the new language would require procedural change which would be disruptive to industry. It could also be interpreted as a subsidy and, depending on how implemented, could set back our discussions with the European space industry on free and fair competition.

Second, the amendment fails to include the revised definition of "launch service" to include launch system production. We proposed this several months ago, the Air Force did, to the committee. A

broader definition would allow the Government to provide additional services that have been requested by the commercial users, especially in the areas of quality control.

Third, we note that the proposed revision deleted requirements for the Secretary of Transportation to consult with the Department of Defense and other Government agencies when setting insurance limits. We have worked hard to establish this consultative procedures and a strong and positive relationship between the Department of Transportation and the Department of Defense. We believe the consultation provisions of the current law encourage this good relationship and we recommended—recommend that these provisions be retained.

Fourth, in the area of launch vehicle research and development, NASA and the Department of Defense are jointly developing new booster technologies under the auspices of the Advanced Launch System—the ALS. We believe the proposed legislation could undermine the ALS program by creating a separate booster technology development program which eventually could become competitive with the joint program.

In concluding, Mr. Chairman, let me say that my comments on the draft legislation reflect the Air Force's continued support for the growth of a private sector space industry. The concerns we express today focus upon possible unintended consequences and detrimental impacts of the proposed amendments. I appreciate the opportunity to address you today and participate in these discussions.

[The prepared statement of Dr. Cook follows:]

DEPARTMENT OF THE AIR FORCE

STATEMENT OF
DR. CHARLES W. COOK
DEPUTY ASSISTANT SECRETARY
SPACE PLANS AND POLICY

BEFORE THE
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS
HOUSE OF REPRESENTATIVES

CONCERNING
H.R. 3765
COMMERCIAL SPACE LAUNCH ACT
AMENDMENT OF 1987

FEBRUARY 16, 1988

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE:

IT IS A PLEASURE TO BE HERE WITH YOU TODAY AND TO HAVE THE OPPORTUNITY TO DISCUSS WHERE WE ARE AND WHERE WE ARE GOING IN SUPPORTING THE UNITED STATES' COMMERCIAL SPACE LAUNCH INDUSTRY.

LAST SEPTEMBER, THE AIR FORCE TESTIFIED BEFORE THIS COMMITTEE. AT THAT TIME HE DESCRIBED THE PROGRESS THAT THE AIR FORCE HAD MADE TOWARD IMPLEMENTING THE COMMERCIAL SPACE LAUNCH ACT. WE TOLD YOU OF THE MODEL RANGE AGREEMENT WHICH IS THE IMPLEMENTING MECHANISM WE DEVELOPED JOINTLY WITH NASA AND THE DEPARTMENTS OF TRANSPORTATION AND COMMERCE TO PROVIDE GOVERNMENT LAUNCH SERVICE SUPPORT TO PRIVATE INDUSTRY. WE ALSO DESCRIBED THE POSITIVE BENEFITS THAT A HEALTHY PRIVATE LAUNCH INDUSTRY ACCRUES FOR THE NATIONAL

DEFENSE AND NOTED A RECIPROCAL EXAMPLE WHEREIN THE U.S. AIR FORCE PROCUREMENT OF DELTA II LAUNCH SYSTEMS ENCOURAGED AND FACILITATED THE McDONNELL DOUGLAS CORPORATION TO COMPETE IN THE COMMERCIAL SPACE LAUNCH MARKET.

SINCE SEPTEMBER, THE EXECUTIVE AGENCIES HAVE MADE GREAT PROGRESS BOTH AT THE POLICY AND AT THE TECHNICAL LEVELS. WITHIN THE ADMINISTRATION, WE HAVE DEALT EFFECTIVELY WITH THE LEADERSHIP ISSUE. THE NEW NATIONAL SPACE POLICY CLEARLY ESTABLISHES THE POLICY FRAMEWORK WITHIN WHICH A COMMERCIAL SPACE LAUNCH INDUSTRY CAN FLOURISH. THAT POLICY RECOGNIZES A COMMERCIAL SPACE SECTOR CO-EQUAL WITH, AND SUPPORTIVE OF THE NATIONAL SECURITY AND GOVERNMENT CIVIL SPACE SECTORS. IT ALSO ESTABLISHES GUIDANCE ON GOVERNMENT SPACE ACTIVITIES SO AS TO AVOID ACTIONS THAT PRECLUDE OR DETER U.S. COMMERCIAL ENDEAVORS. FURTHER, THROUGH THE

ECONOMIC POLICY COUNCIL, ALL INVOLVED GOVERNMENT AGENCIES HAVE PARTICIPATED IN DEVELOPING INITIATIVES WHICH, WHILE NOT PROVIDING SUBSIDIES, DO ENCOURAGE INDUSTRY DEVELOPMENT. TWO OF THESE INITIATIVES WHICH ARE PARTICULARLY RELEVANT TO THE COMMERCIAL SPACE LAUNCH ACT ARE:

INSURANCE RELIEF FOR LAUNCH PROVIDERS

CONSULTATION ON DEVELOPMENT OF PRIVATE LAUNCH RANGES

THE AIR FORCE HAS BEEN AN ACTIVE AND POSITIVE FORCE IN THE U.S. TRADE REPRESENTATIVE-LED DISCUSSIONS WITH THE EUROPEAN SPACE AGENCY. WE BELIEVE THESE TALKS ARE PROVING BOTH INFORMATIVE AND PRODUCTIVE. THEY HOLD OUT REAL PROMISE FOR ESTABLISHING AN EQUITABLE LONG-TERM ENVIRONMENT FOR FREE AND FAIR SPACE LAUNCH COMPETITION. A KEY TO THE SUCCESS OF THESE DISCUSSIONS HAS BEEN THE AIR FORCE BRIEFINGS ON PROCEDURES FOR IMPLEMENTING THE MODEL AGREEMENT AND OUR

ABILITY TO DEMONSTRATE THAT DIRECT COST PRICING POLICIES DO NOT CONSTITUTE GOVERNMENT SUBSIDIES.

BEYOND THESE POLICY FORUMS, THE AIR FORCE, WORKING WITH INDUSTRY, HAS MADE SUBSTANTIAL PROGRESS ON THE TECHNICAL LEVEL. E-PRIME, MARTIN MARIETTA, AND GENERAL DYNAMICS HAVE ALL SIGNED COMMERCIAL LAUNCH SERVICE AGREEMENTS (TAILORED VERSIONS OF THE MODEL AGREEMENT) WITH THE AIR FORCE. WE ANTICIPATE THAT McDONNELL DOUGLAS WILL ALSO SIGN WITHIN THE NEXT SEVERAL WEEKS. FURTHER, THE MODEL AGREEMENT HAS BECOME A LIVING DOCUMENT. WORKING WITH INDUSTRY WE HAVE IDENTIFIED AREAS WHERE CHANGES IN THE CONTRACT WERE APPROPRIATE, SUCH AS: THE ENVIRONMENTAL PROTECTION RESPONSIBILITIES; PROVISION OF CONTRACT ADMINISTRATION SERVICES AND QUALITY ASSURANCE SUPPORT; AND LIMITS OF CORPORATE LIABILITY FOR LAUNCH FAILURES CAUSED BY

THE MISCONDUCT OF GOVERNMENT EMPLOYEES. IN EACH OF THESE AREAS, WE HAVE MADE SUCH CHANGES.

WE HAVE ALSO UNDERTAKEN A STUDY TO DETERMINE THE VALUE OF GOVERNMENT PROPERTY PLACED AT RISK DURING THE VARIOUS STAGES OF COMMERCIAL SPACE LAUNCH ACTIVITIES. THIS IS A COMPLICATED ANALYSIS BECAUSE IT MUST ADDRESS, FOR EACH VEHICLE AND LAUNCH AZIMUTH, BOTH FIXED COSTS SUCH AS THE VALUE OF BUILDINGS, AND VARIABLE COSTS SUCH AS THE VALUE OF SATELLITES OR ROCKETS LOCATED NEAR THE LAUNCH SITE COULD BE AT RISK IN THE EVENT OF AN ACCIDENT. ONCE COMPLETE, THIS DATA WILL PROVIDE THE BASIS FOR CONSULTATION WITH THE DEPARTMENT OF TRANSPORTATION ON APPROPRIATE INSURANCE LEVELS.

IN THIS REGARD, THE AIR FORCE AND THE DEPARTMENT OF TRANSPORTATION HAVE BEGUN FORMALIZING THE CONSULTATIVE PROCESS AND WE WILL SOON ESTABLISH A PERMANENT STEERING COMMITTEE TO INSURE COORDINATION AND COOPERATION. WE HAVE ALSO ESTABLISHED SINGLE COMMERCIAL SPACE POINTS OF CONTACT: MY OFFICE HAS BEEN DESIGNATED AS THE AIR FORCE FOCAL POINT FOR POLICY, MANAGEMENT AND INTERAGENCY MATTERS. AIR FORCE SYSTEMS COMMAND AND AIR FORCE SPACE DIVISION HAVE ALSO ESTABLISHED SINGLE POINTS OF CONTACT FOR TECHNICAL MANAGEMENT AND PROGRAM IMPLEMENTATION.

OTHER RECENT ACCOMPLISHMENTS INCLUDE THE FOLLOWING:

- COMMERCIAL LAUNCH SCHEDULES HAVE BEEN INCORPORATED INTO GOVERNMENT ELV LAUNCH PLANNING AND MANIFESTS.

- THE AIR FORCE HAS TAKEN ACTION TO MAKE LAUNCH PROPERTY AVAILABLE FOR PURCHASE BY INTERESTED COMMERCIAL LAUNCH USERS.
- THE AIR FORCE HAS DEVELOPED A POLICY ON DIRECT COST WHICH INSURES THAT THE GOVERNMENT NEITHER GAINS NOR LOSES MONEY AS A RESULT OF THE EMERGING INDUSTRY.
- THE AIR FORCE IS ALSO WORKING WITH MARTIN MARIETTA CORPORATION TO MODIFY LAUNCH COMPLEX 40 AT CAPE CANAVERAL AFS FOR DUAL COMMERCIAL TITAN/TITAN IV USE. MARTIN MARIETTA CORPORATION IS PAYING THEIR FAIR SHARE OF THE MODIFICATION COSTS AND WE ARE WORKING CONSTRUCTION TIMELINES TO INSURE COMMERCIAL SPACE LAUNCH SCHEDULES ARE

NOT ADVERSELY IMPACTED. ALSO, DISCUSSIONS ARE ONGOING WITH McDONNELL DOUGLAS TO OPTIMIZE USE OF LAUNCH COMPLEX 17 AT CAPE CANAVERAL FOR COMMERCIAL AND GOVERNMENT LAUNCHES AND WE ARE PREPARED TO ASSIST OTHER COMMERCIAL LAUNCH FIRMS IN SIMILAR WAYS.

ONE ADDITIONAL ACCOMPLISHMENT IS THE MEDIUM LAUNCH VEHICLE II COMPETITION. THIS COMPETITIVE AIR FORCE ACQUISITION WHICH IS CURRENTLY UNDERWAY EMBODIES MANY COMMERCIAL PRINCIPLES. IT GREATLY REDUCES THE TECHNICAL OVERSIGHT AND DOCUMENTATION REQUIREMENTS AND PLACES INCENTIVES ON SUCCESSFUL LAUNCH OPERATIONS. WE BELIEVE THIS APPROACH MAKE GOOD SENSE BOTH FOR THE INDUSTRY AND THE UNITED STATES GOVERNMENT.

LET ME TURN NOW TO THE PROPOSED AMENDMENT TO THE COMMERCIAL SPACE LAUNCH ACT. WE HAVE REVIEWED THIS DOCUMENT VERY CAREFULLY AND, QUITE FRANKLY, WE HAVE A NUMBER OF CONCERNS.

FIRST, IN THE AREA OF INSURANCE, THE DRAFT LEGISLATION PROVIDES DETAILED INSTRUCTIONS ON INSURANCE LEVELS AND RISK ALLOCATION. WHILE THE AIR FORCE FULLY SUPPORTS THE INTENT OF THIS PROPOSAL -- TO LIMIT THE EXPOSURE OF COMMERCIAL LAUNCH FIRMS TO A QUANTIFIABLE AND INSURABLE LEVEL -- WE BELIEVE THE SPECIFICATION OF DOLLAR LIMITS ON LIABILITY AND THE PROVISIONS FOR CROSS WAIVERS ARE UNNECESSARY CONSTRAINTS. IN THE LONG TERM, LACK OF GOVERNMENT FLEXIBILITY WILL WORK TO THE DETRIMENT OF THE INDUSTRY.

SECOND, THE SECTION OF THE DRAFT LEGISLATION WHICH DEALS WITH "LAUNCH INCENTIVES FOR ELIGIBLE SATELLITES" APPEARS TO HAVE UNINTENDED CONSEQUENCES. WE UNDERSTAND THE INTENT OF THE DRAFTERS OF THIS LEGISLATION WAS TO REDRESS THE PROBLEMS CREATED FOR COMMERCIAL SATELLITES PREVIOUSLY MANIFESTED ON THE SPACE SHUTTLE. NASA ESTIMATES THAT THERE ARE TWENTY-TWO POSSIBLE "ELIGIBLE" SATELLITES. OF THESE, ONE HAS BEEN LAUNCHED AND APPROXIMATELY SEVEN HAVE COMMITTED THEMSELVES TO FOREIGN LAUNCH VEHICLES, LEAVING FOURTEEN SATELLITES WHICH COULD BE LICENSED BY THE DEPARTMENT OF TRANSPORTATION FOR DOMESTIC ELV LAUNCHES AND QUALIFY FOR PREFERENTIAL TREATMENT. OF THESE FOURTEEN, THREE ARE FOREIGN, FOUR ARE INTERNATIONAL, AND ONLY SEVEN ARE DOMESTIC.

IF THE DRAFT LEGISLATION WERE IMPLEMENTED, THE U.S. GOVERNMENT WOULD BE SUBSIDIZING THESE SATELLITES -- FOREIGN AS WELL AS DOMESTIC -- AT THE EXPENSE OF ALL OTHER COMMERCIAL SATELLITES. ADDITIONALLY, LAUNCH PRIORITY COULD

ADVERSELY IMPACT OTHER DOMESTIC SATELLITES AND THE PROVISION OF PAYLOAD PROCESSING AT TAXPAYER EXPENSE WOULD HAVE A SERIOUS ADVERSE EFFECT ON THE COMMERCIAL ENTITY PRESENTLY OFFERING PAYLOAD PROCESSING SERVICES. FURTHER, THE SATELLITE OWNERS WHO WERE MANIFESTED ON THE SHUTTLE, BUT HAVE SUBSEQUENTLY COMMITTED TO A FOREIGN LAUNCH VEHICLE, WOULD BE PLACED AT A COMPETITIVE DISADVANTAGE WHICH SEEMS UNFAIR SINCE, BY AND LARGE, THESE WERE THE SATELLITES WHICH WERE READY FOR LAUNCH RATHER THAN JUST PLANNED AT THE TIME OF THE SHUTTLE DECISION.

ANOTHER CONCERN ASSOCIATED WITH THIS PROVISION RELATES TO FUNDING. THE DRAFT LEGISLATION WOULD REQUIRE THE AIR FORCE TO PROVIDE LAUNCH SUPPORT FREE OF COST FOR THE LAUNCH PROVIDERS OF ELIGIBLE SATELLITES. THE AIR FORCE HAS NO APPROPRIATION FOR PROVIDING SUCH SERVICES, NOR IS THERE

ANY GUARANTEE THAT THE LAUNCH PROVIDERS WOULD PASS ON THE WINDFALL TO THE SATELLITE OWNER.

THIRD, THE PREEMPTION PROVISIONS OF THE DRAFT LEGISLATION MAY HAVE SIMILARLY UNINTENDED CONSEQUENCES. FIRST, LET ME CLEARLY STATE THAT IT IS THE INTENT OF THE AIR FORCE TO FULLY UTILIZE THE SPACE LAUNCH RANGES WHICH WE OPERATE, FIRST BY MEETING U.S. GOVERNMENT LAUNCH NEEDS AND THEN BY MAXIMIZING LAUNCH OPPORTUNITIES FOR COMMERCIAL LAUNCH ENTERPRISES. WE ARE WORKING CLOSELY WITH ALL THE LAUNCH COMPANIES TO ENSURE THEIR CAPABILITY TO PERFORM COMMERCIALLY VIABLE LONG-TERM PLANNING. HOWEVER, THERE ARE ASPECTS BEYOND OUR CONTROL WHICH MAY IMPACT COMMERCIAL LAUNCH SCHEDULES. IT IS NOT CLEAR HOW THESE WOULD BE INTERPRETED IN THE CONTEXT OF THE "NOT UNREASONABLY PREEMPTED" STANDARD PROPOSED IN THE LEGISLATION. WITH SO

MANY UNKNOWN OR UNCONTROLLABLE FACTORS IMPACTING SCHEDULES, A REQUIREMENT FOR THE GOVERNMENT TO PAY LIQUIDATED DAMAGES FOR SCHEDULE DELAYS OR PREEMPTIONS WOULD INCENTIVIZE THE AIR FORCE TO BE VERY CONSERVATIVE IN THE ALLOCATION OF LAUNCH DATES. THUS, THE LEGISLATION INTENDED TO AID INDUSTRY COULD IN THE LONG RUN SERVE AS A LIMITATION ON ITS GROWTH AND PROFITABILITY.

IF LEGISLATION IS JUDGED TO BE NECESSARY, OUR RECOMMENDATION IS THAT A SENSE OF THE CONGRESS STATEMENT THAT THE AIR FORCE MAKE A BEST EFFORT TO MINIMIZE SCHEDULE DISRUPTIONS WOULD BETTER SERVE THE PURPOSE AND INTENT OF THE LEGISLATION THAN THE IMPOSITION OF FINANCIAL PENALTIES WHICH WOULD INEVITABLY FALL UPON THE TAXPAYERS.

FOURTH, WHILE IT IS DIFFICULT TO OBJECT TO A STUDY, THE AREA OF MANIFESTING IS ONE WHERE WE HAVE MADE SUBSTANTIAL PROGRESS AND IN WHICH WE DOUBT THAT A CONGRESSIONALLY DIRECTED STUDY COULD SHED NEW LIGHT. THE AIR FORCE HAS WORKED WITH EACH SPACE LAUNCH COMPANY AS WE ENTERED INTO AGREEMENTS TO ESTABLISH LAUNCH SCHEDULES AND LAUNCH RATES. WE CONTINUE TO WORK WITH THESE CORPORATIONS AS THEIR SCHEDULES CHANGE AND OUR FEEDBACK FROM THE INDUSTRY HAS BEEN POSITIVE AND SUPPORTIVE OF THE PROCEDURES WE HAVE ESTABLISHED. A STUDY WOULD ONLY SERVE TO DIVERT LIMITED RESOURCES FROM THIS PRODUCTIVE PROCESS.

THERE ARE FOUR ADDITIONAL FEATURES OF THE PROPOSED LEGISLATION UPON WHICH I WOULD LIKE TO BRIEFLY COMMENT.

FIRST, THE REDEFINITION OF DIRECT COST IS CONFUSING AND SEEMS TO BLUR THE DISTINCTION BETWEEN DIRECT AND MARGINAL COSTS. WE HAVE LEARNED TO OPERATE UNDER THE EXISTING DEFINITION AND BELIEVE THE NEW LANGUAGE WOULD REQUIRE PROCEDURAL CHANGE WHICH WOULD BE DISRUPTIVE TO INDUSTRY. IT ALSO COULD BE INTERPRETED AS A SUBSIDY AND DEPENDING ON HOW IMPLEMENTED, COULD SET BACK OUR DISCUSSIONS WITH THE EUROPEAN SPACE AGENCY ON FREE AND FAIR COMPETITION.

SECOND, THE AMENDMENTS FAIL TO INCLUDE A REVISED DEFINITION OF "LAUNCH SERVICES" PROPOSED MONTHS AGO BY THE AIR FORCE. A BROADER DEFINITION WOULD ALLOW THE GOVERNMENT TO PROVIDE ADDITIONAL SERVICES REQUESTED BY COMMERCIAL USERS.

THIRD, WE NOTE THAT THE PROPOSED REVISION DELETED REQUIREMENTS FOR THE SECRETARY OF TRANSPORTATION TO CONSULT

WITH THE DEPARTMENT OF DEFENSE AND OTHER GOVERNMENT AGENCIES WHEN SETTING INSURANCE LIMITS. WE HAVE WORKED HARD TO ESTABLISH CONSULTATIVE PROCEDURES AND A STRONG AND POSITIVE RELATIONSHIP BETWEEN THE DEPARTMENT OF TRANSPORTATION AND THE DEPARTMENT OF DEFENSE. WE BELIEVE THE CONSULTATION PROVISIONS OF THE CURRENT LAW ENCOURAGED THIS GOOD RELATIONSHIP AND RECOMMEND THESE PROVISIONS BE RETAINED.

FOURTH, IN THE AREA OF LAUNCH VEHICLE RESEARCH AND DEVELOPMENT, NASA AND THE DEPARTMENT OF DEFENSE ARE JOINTLY DEVELOPING NEW BOOSTER TECHNOLOGIES UNDER THE AUSPICES OF THE ADVANCED LAUNCH SYSTEM (ALS). WE BELIEVE THE PROPOSED LEGISLATION COULD UNDERMINE THE ALS PROGRAM BY CREATING A SEPARATE BOOSTER TECHNOLOGY DEVELOPMENT EFFORT WHICH EVENTUALLY COULD BECOME COMPETITIVE WITH THE JOINT PROGRAM.

THE PRIVATE SECTOR IS HEAVILY INVOLVED IN PROVIDING SUPPORT FOR THESE ADVANCED TECHNOLOGY EFFORTS. AS YOU KNOW, THE ADMINISTRATION ALREADY HAS STRONG POLICIES IN PLACE TO PROVIDE FOR EFFICIENT AND EFFECTIVE TECHNOLOGY TRANSFER TO THE PRIVATE SECTOR. THE PATENT LAW ADMENDMENTS OF THE EARLY 1980'S, THE TECHNOLOGY TRANSFER ACT, AND, MOST RECENTLY EXECUTIVE ORDER 12591, ALL ENSURE THAT TECHNOLOGY WILL MOVE OUT OF THE FEDERAL GOVERNMENT INTO THE PRIVATE SECTOR. THESE ACTONS ALONG WITH STRONG INVOLVEMENT FROM THE COMMERCIAL SPACE SECTOR IN MEETING ALL OUR SPACE LAUNCH NEEDS MAY RESULT IN AN APPROACH AS HIGHLY SUCCESSFUL AS THE ONE NASA AND DoD HAVE DEVELOPED FOR AERONAUTICAL TECHNOLOGY OVER THE YEARS WITH EVENTUAL SPINOFFS TO CIVIL AND COMMERCIAL AVIATION. SUCH AN APPROACH WOULD HELP ENSURE THAT ALL APPLICABLE NEW TECHNOLOGY WAS AVAILABLE TO SUPPORT THE UNITED STATES' SPACE INTERESTS.

IN CONCLUDING, MR. CHAIRMAN, LET ME SAY THAT MY COMMENTS ON THE DRAFT LEGISLATION REFLECT THE AIR FORCE'S CONTINUED SUPPORT FOR THE GROWTH OF A PRIVATE SECTOR SPACE INDUSTRY. THE CONCERNS WE EXPRESS TODAY FOCUS UPON POSSIBLE UNINTENDED CONSEQUENCES AND DETRIMENTAL IMPACTS OF THE PROPOSED AMENDMENTS. I APPRECIATE THE OPPORTUNITY TO ADDRESS YOU TODAY AND LOOK FORWARD TO YOUR QUESTIONS.

Mr. NELSON. Thank you, Dr. Cook, gentlemen.

Mr. Stadd, I want to acknowledge your statement about a proposed cap on third-party liability damages and, according to what you said, that the Administration is going to be proposing draft legislation that would bring about such change. When will that legislation be coming?

Mr. STADD. We are hoping, sir, that that will be available within the next 10 days.

Mr. NELSON. You know our concern. There have been statements like that in the past—

Mr. STADD. Yes, sir. Understand.

Mr. NELSON [continuing]. And the legislation hadn't gotten here and so on. So.

Mr. STADD. Understand.

Mr. NELSON. Now let me tell you that because of the sensitivity of this fledgling commercial launch industry we don't want to diddle with this thing. We want to get it moving. That's why I said we're going to be marking up very soon. And one of the things that we have to be concerned about in this committee is crafting a piece of legislation that is the right thing to do and that can also maneuver itself among the treacherous legislative waters.

Now the proposal that you have made is a proposal that sends people outside of space into apoplexy. It gets into the age-old confrontation about limitation of damages. That also—I mean, that's a classic example that's going on whether you're talking about consumer product liability, whether you're talking about this kind of liability, whether you're talking about medical malpractice liability. Different sectors of the economy go after it tooth and nail and it's highly controversial. It, basically, gets right down to the question of tort reform, which is an extremely large subject having nothing to do with space, which is most focused in all of these other areas.

So we have crafted this legislation trying to avoid that major controversy and still have something that will give stability to the launchers so that they know what they can rely on. So that is part of my comment in response to what you have laid out.

Mr. STADD. Yes, sir.

Mr. NELSON. And we'll proceed and visit on that subject in the future.

Mr. STADD. Yes, sir.

Mr. NELSON. All right. Let me turn to our members. Mr. Perkins?

Mr. PERKINS. Well, Mr. Chairman, I really was struck pretty much by the same thing that you're talking about here today. And, Mr. Stadd, I suppose that I have a great deal of difficulty in my own mind kind of listening to what you're talking about bringing forward and seeing that as a realistic proposal that's going to get through the Congress in a period of time that's going to do anybody any good. Now I am cosponsor of the legislation that the chairman has introduced and that we feel is very necessary in terms of trying to get something accomplished within the period of time.

But I suppose my question really is, what is your feeling having reviewed the legislation that has been proposed so far—what is the

Department of Transportation's feeling about the legislation that has been proposed?

Mr. STADD. If I may respond, Mr. Chairman and Congressman Perkins, to both of you with this answer. As you're both alluding to, this whole insurance issue is quite controversial, quite complex, and there've been a number of various alternatives proffered over the years to address different industry sector interests.

On the indemnification front one runs into the question of budgetary problems. Essentially in the case of indemnification the Congress is basically almost relinquishing authority over appropriations in the sense you're establishing an almost unlimited claim on the judgment fund which, in turn, results in other Members of Congress and other executive agencies that get upset over the budgetary implications.

Mr. PERKINS. Well, was it——

Mr. STADD. If I may——

Mr. PERKINS. Sure.

Mr. STADD. Just to be sure I'm answering on point. After deliberation on this and hearing both sides for so many months on this issue, it seems to us that the core problem is this question of personal liability. This question of which juries do tend to award tremendous amounts that may or may not be commensurate with making the original parties whole, and it is the judgment of the Administration that the most sound approach is to address the core issue, which is that issue, at the same time that we deal with it on the property side as we have, which is basically bounding the risk for both Government and industry in the way I've suggested.

The other question, the other perspective is in the area of excess liability. Congress, as you know, many years ago established the Price-Anderson fix for the nuclear industry. I think the amount was something on the order of—maybe I'm wrong—about \$500 or \$560 million. Recently that's been suggested it ought to be upped, up to about \$7 billion. The problem is that the experts say that you never had lines of insurance established to cover excess coverage because you have the chicken and egg problem. You had people who said, well, there isn't a market for it because there's no need for it, and then others who say there's no need for it because we've been indemnifying all these years. And although there are lines of coverage in the London markets that do cover excess coverage, there's none for commercial spacecraft. And there are those who do argue that because we did provide some indemnification these past few years for commercial launch activities that that market never in fact evolved.

So that basically were the types of arguments that resulted in this recommendation.

Mr. PERKINS. Well, in terms of just talking about Price-Anderson, because that is exactly what I was going to be bringing up——

Mr. STADD. Yes, sir.

Mr. PERKINS [continuing]. A minute ago, it does seem that that has allowed the nuclear industry to proliferate, if you will, and not be impeded in terms of what it was trying to do. It was an effective approach in accomplishing the goal that it was trying to accomplish. And the only argument that I'm listening to is that it didn't

allow the industry a chance to develop, the insurance industry a chance to develop.

But it seems to me that the thrust of what we're interested in here is allowing the commercial launch industry an opportunity to get itself into an operation with an insurance plan that is going to be commercially reasonable, and that I suppose is really the focus of what we're interested in here on this committee.

Mr. STADD. Agree.

Mr. PERKINS. I suspect I have some difficulty and—I personally have difficulty with the idea of limitation of damages in the tort-type situation, and I am an attorney and I'll admit that bias. But trying to put that question aside whether you're for it or against it, it strikes me that just in terms of the political reality that we're going to be dealing with it is not going to be something that we'll be able to get into place as rapidly as we would an alternative such as the committee legislation, and I just might pass that on.

And briefly—I don't want to take too much time—Mr. O'Brien, in terms of the allocation of risk, how is Arianespace presently accomplishing that?

Mr. O'BRIEN. I don't believe that I could actually give you a reliable answer to that. I'd be happy to get that for you, however, and submit it for the record. I would hate to make a misstatement in front of Doug Heydon, who is in the audience and would correct me in a hurry. I'd rather do it right and provide it for the record.

Mr. NELSON. Okay. We had asked you to provide that for us here today. Can you—yes, sir, that was conveyed from our staff to your staff.

Mr. O'BRIEN. Mr. Chairman, I claim surprise. I'm sorry.

Mr. NELSON. Okay. You might check your communications flow.

Mr. O'BRIEN. I shall.

[The information follows:]

The most recent source of information which NASA has on private contractual relationship between ARIANESPACE and a launch customer arose in the pre-Challenger time frame of late 1985.

At that time, ARIANESPACE itself was purchasing third party liability insurance for its ELV customers in the amount of four hundred million French francs. This third-party coverage was for a thirty-six (36) month period with the customer agreeing to indemnify ARIANESPACE for all third-party liability after that period of time. In addition, during the 36 month period, ARIANESPACE agreed to indemnify the customer for third-party losses above the insurance claims. Presumably, the cost of this insurance package was included in the launch price.

I do not have available any information on the current insurance agreements which ARIANESPACE is offering its customers.

Mr. NELSON. All right.

Well, let me just follow Mr. Perkins' comments by saying that here we have a fledgling industry. Everybody in this room, well, reasonably everybody in this room, perhaps, save for the KGB agents in the room, want to see this fledgling industry succeed. It's clearly in the interest of this country, it's in the interest of the satellite manufacturers, it's in the interest of our development of technology that we see this industry succeed. So that's what we're about here, now.

Now the question is, Mr. Perkins has raised the issue, in this legislation that you're trying to help smooth the way, and as we massage it and change it and amend it, and so forth, do we want to get

into this nest of thorns of the age-old fight between the American Bar Association and the National Association of Manufacturers, which is tort reform, or do we want to approach it from protection of the public interest, which is the provision that we have taken. And I think the expression on our committee is, if we took this, we're going to be in an agenda and in a fight that has been going on for years and nobody's solved that, and for us to get embroiled in that fight and not be allowed then to get this legislation moving is contrary to the interest of the public. Contrary to the interest of this country. And that's the approach we've taken and I appreciate you raising those issues.

Mr. Skaggs?

Mr. SKAGGS. Thank you, Mr. Chairman.

Mr. O'Brien, I wondered if you could just refresh my memory about the extent of NASA-owned launch assets at this point. What facilities do you control?

Mr. O'BRIEN. I think primarily what we're talking about are the tooling, the jigs, the dies, the equipment which are used in the manufacturing of the launch vehicles such as the Atlas or the Delta, for example.

Mr. SKAGGS. But, as far as launch sites, you've got Wallops Island, is that correct?

Mr. O'BRIEN. Yes.

Mr. SKAGGS. And?

Mr. O'BRIEN. And we are making launch sites available as well, yes.

Mr. SKAGGS. At the Cape?

Mr. O'BRIEN. Yes. Complex 36, for example.

Mr. SKAGGS. Okay. The reason for wanting to establish that, it appeared from what I've heard this afternoon and earlier that NASA is taking a kind of demurring attitude and letting DOT and the Air Force be the real operators in developing policy as to the use of Government-owned assets. And I'm just curious, one, if that's a correct reading; and, if so, why things are proceeding in that way.

Mr. O'BRIEN. Well, two things. Number one, my statement with regard to demurring I think was made in the context of the implementation of a particular statute which happens to be one that governs the activities of the Department of Transportation and not necessarily NASA, in that sense.

To the extent that you may extend that to a wider horizon, I would have to say that NASA has been a very active participant in all of the policy planning and formulation which has been underway for some time. I didn't mean to imply in any way that we're not a very active partner in the development of the policies than we are within the Administration. So in that sense, we have not demurred in any particular direction. We are working very closely with both organizations represented by these gentlemen.

Mr. SKAGGS. Thank you. Dr. Cook, you mentioned in your testimony that you've been able to work out arrangements with several commercial launch providers that seem to have addressed some of the questions that came up in our hearings last year. Could you go into some of the particulars of that, how you've dealt with the specifics of the liability insurance issue in particular? And secondly, as

your arrangements have evolved, do you go back and revise to the benefit of earlier licensees your contracts so that everybody is basically getting the same deal?

Dr. COOK. Let's see. We've had, as you know—as you know, we circulated the Model Agreement and we were able to obtain a number of suggestions from various of the launch providers. We have been able to change some of those provisions, to take some of their suggestions and go back, and we now have a new Model Agreement, a new version, if you will, that we are sending out to all the people that we provided it to initially, plus we will go back and offer these changes to those who have already signed so that if they wish to pick up on those.

Some of the things that we have been able to incorporate, there have been concerns about environmental protection and we have been able to incorporate there that the people, the launch providers, will only be responsible for their acts; that they will not be responsible for any of the Government acts associated with that. We have made some provisions for quality assurance that people have requested, and we have been able to work some of those into the process.

There is still some disagreement, as you have heard, with regard to liability both for third party and second parties, and that is under active consideration. It's a little bit bigger question at the moment in the Air Force, but we are fully supportive of limiting the liability as far as the commercial launch providers go.

Mr. SKAGGS. I assume the committee has copies of the revised Model Launch Agreement.

Dr. COOK. I'm not sure that we have submitted that yet. I don't believe we have sent it out. Let's see, I have my adviser with me. Could you comment on the status of that?

VOICE. It's available today, and we can make a copy of it available.

Mr. SKAGGS. Would appreciate that.

And finally, Mr. Stadd, I was a little unclear in your testimony where the line gets drawn between what you feel you are capable of undertaking by way of rulemaking and what areas require, or need to be addressed through legislation. It would seem to me that you were expressing a fairly broad rulemaking ambit there and I wanted to get a handle on that, if you would, please.

Mr. STADD. Sure. On your, I believe it's 16—15(c) in the original Act we have the authority to establish criteria for hold harmless cross waiver requirements at the ranges, and we'll be exercising that. So, specifically, we feel we have authority under the Act to establish the criteria for mandating levels of insurance, and over that level having the Government waive its right to recover damages on the property side, the first or second party.

Where the legislation comes in is specifically on the capping of non-economic damages that we were referring to—

Mr. SKAGGS. So absent the cap issue, you don't really see a need for legislation?

Mr. STADD. That is correct, sir.

Mr. SKAGGS. Thank you, Mr. Chairman.

Mr. NELSON. Thank you, Mr. Skaggs.

I wanted to get into the record here the question and answer that you said you were surprised that we expected you to enter, Mr. O'Brien. The question is how does Ariane handle the risk allocation, the third-party liability problem? And the answer is that they borrowed the NASA model from Shuttle. And we will have you submit that formally for the record, but I will put into the record at this point a letter here from Arianespace, signed by its President Mr. Heydon, dated October 7th of last year, in which he says that "It is important to note that the historical basis for our requiring our customers to obtain 400 million French franc equivalent"—which is about today \$63 million—"coverage is very simply that when we began writing our first commercial contracts the only model was NASA." Continuing the quote: "The real question is not subsidy but risk-sharing by the private and public sectors." End of quote. And we will let you formally respond to that.

[The letter referred to is contained in Appendix 3.]

Mr. NELSON. Mr. Andrews?

Mr. ANDREWS. Thank you, Mr. Chairman.

Just a couple of questions to ask you to expand a little bit on your earlier testimony, Mr. O'Brien. You made a comment briefly about that provision that requires NASA to do some pretty fundamental research in development and then transfer that to the private sector, to do the early work. Would you expand on that a little bit? Is that unique? And, if so, what do you see, the significance of it? How do you see it working?

Mr. O'BRIEN. Let me see if I can put it this way. That's our bread-and-butter activity and always has been, primarily in the area of aeronautics, as you probably well know. Since the beginning of NASA we took over what was then the existing research capabilities of the United States Government with regard to aeronautics, and we have ever since been developing technology, sharing it with the industry on a very wide basis. All I'm suggesting is that section 9 seems to just take that further into the commercial world in support of commercial initiatives, and that's our thing.

Mr. ANDREWS. Good. Well, let me ask you to address another part of your testimony, and that's the cross waiver approach. I wonder if you would expand on that a little bit. First of all, explain it to me again. What is it? What does it mean and what's significant about it?

Mr. O'BRIEN. Basically, it's a no fault kind of approach to property damage in Shuttle, and now Space Station, operations whereby each participant agrees, in a Shuttle flight, for example, to not bring any action against any other participant in the same mission for any loss of or damage to property that might occur on that mission. For example, if a payload on a Shuttle mission should come loose and rattle around, damage the Shuttle and, perhaps, another payload on board, what the parties have done is agree in advance they will not bring any action for damage against one another for that type of damage.

Now that doesn't mean that people can't insure against any damage that might occur. That's up to them. But what we've done is remove the Shuttle as an element of damage from the equation, for example. It's a no-fault approach to property damage.

Mr. ANDREWS. Dr. Cook, in your testimony you stated that you thought a cross waiver provision was unnecessary; is that correct?

Dr. COOK. See, I don't believe that I testified——

Mr. ANDREWS. Well, let me read it. Let me read what I think is your testimony. On page 9, down at the bottom of that page, it says, "We believe the specification of dollar limits on liability and the provisions for cross waivers are unnecessary constraints and the long term lack of Government flexibility will work to the detriment of the industry." What do you mean by that?

Dr. COOK. What I meant by that was, essentially, that things like specifying the amount of liability, and I believe in the proposed amendment in the case of Government property it was \$100 million or something like that, that to have that kind of rigidity will probably not work well in the long-term interest. For example, \$100 million for the Government—to provide for Government property may or may not be even close to adequate for the kind of losses that could be sustained by a commercial launch vehicle flying into Government property, for example, and damaging another booster or another satellite.

Mr. ANDREWS. No, I'm not talking about liability limits. I'm really referring to what Mr. O'Brien has testified to, and that's the cross waiver provisions. Seems like a pretty good idea to me. Seems like it's a, the way he's just stated for us, a fairly flexible approach to a problem that I would think we'd be able to anticipate we're going to have to deal with. Why do you think that's not necessary? Why do you think that's restrictive?

Dr. COOK. I'm at a loss to see why the cross waiver needs to apply to this situation.

Mr. ANDREWS. Mr. O'Brien?

Mr. O'BRIEN. Yes, sir?

Mr. ANDREWS. How do you respond to that? Why do you think it's important?

Mr. O'BRIEN. Okay. I think the problem that some folks may be having is taking the concept and adapting it to a purely commercial launch operation. We were driven by the gargantuan exposure of the Space Shuttle itself and how to reconcile that with our need to accommodate our customers. I'm not sure whether when you scale down or scale to a different type of operation such as purely commercial whether it is a transferable concept. I just haven't really focused on that in my own thinking and I don't know to what extent the new Administration policy addresses that. Perhaps Courtney could——

Mr. NELSON. Well, let me just read from the statement released by the White House last week, February the 11th, under "Limits on Property Damage Liability":

"If losses to the Government exceed this level, the Government will waive its right to recover for damages. If losses are less than this level, the Government will waive its right to recover for those damages caused by the Government willful misconduct or reckless disregard."

So there is cross waiver. So, Dr. Cook, you might get your staff double-checking.

Dr. COOK. I'm sorry. I did not interpret that to be cross waivers. I understand why we would waive above certain values, but the cross

waiver that was mentioned implies something different to me than that.

Mr. NELSON. Okay. Are we all saying the same thing now?

Okay. Mr. Andrews?

Dr. COOK. I don't know.

Mr. ANDREWS. I think we're all saying the same thing, and I think we all understand.

Dr. COOK. I do not disagree with the concept of waivers in this situation, but in a commercial launch the cross waiver kind of thing—

Mr. NELSON. All right. What is it that you disagree with, then? Let's make that clear for the record.

Excuse me, Mr. Andrews.

Dr. COOK. I thought I made that clear by saying that I disagreed with the statement, the rigidity of listing maximum amounts—

Mr. ANDREWS. Okay.

Dr. COOK. Of the liability.

Mr. ANDREWS. Now I understand that, and I can understand your opposition to that. The part I don't understand is this cross waiver approach that's just been outlined by Mr. O'Brien in his testimony and elaborating on it this afternoon, and I want to be sure I understand whether you disagree with that or not.

Dr. COOK. Well, I do not disagree with it as far as the Shuttle goes. But what I'm saying is I think I disagree with cross waivers with regard to commercial launches.

Mr. ANDREWS. Okay.

Dr. COOK. I do not disagree with a waiver that the Government would waive rights above some liability amount. I do not disagree with that and I think that gets—if I understand your question, I think that's what you're trying to get me to say, and I do not disagree with that.

Mr. ANDREWS. All right. Did you want to add something?

Mr. O'BRIEN. Yes, Congressman, that is the intent of the White House proposal, to waive over the limit that the Department sets. So, I'm just saying that there is concurrence on that.

Mr. ANDREWS. Okay. Thank you, Mr. Chairman.

Mr. NELSON. Okay. Now, for the record, I want to address Dr. Cook's concern here. You say that you disagree with setting the maximum amount of liability. You want it to remain flexible. Is that the thrust of your comments?

Dr. COOK. Yes. I think it's a variable quantity that will vary due to any number of circumstances. It will vary depending on the launch vehicle that you're talking about, the commercial launch vehicle. It will vary depending on where the launch pad is located. It will vary depending upon what facilities are in the vicinity and what are in those facilities.

Mr. NELSON. Okay.

Dr. COOK. That is kind of an individual event that needs to be decided at the time as to what a reasonable amount of liability insurance should be undertaken.

Mr. NELSON. All right. I want to make sure that we are disagreeing on exactly the right—I mean, that we understand where the disagreements are. Because as I read the policy as enunciated by the Reagan Administration, that they actually have a maximum in

their policy, and it's the maximum amount will be the amount of insurance obtained. And I read on page 4, "Limits on Property Damage Liability":

"The liability of commercial launch operators for damage to Government property resulting from a commercial launch accident will be administratively limited to the level of insurance required by the Department of Transportation."

Dr. COOK. That's correct.

Mr. NELSON. All right. They're going to set that.

Dr. COOK. They're going to set that.

Mr. NELSON. Now that's the—

Dr. COOK. Hopefully, they will set that in consultation with the Department of Defense.

Mr. NELSON. And then it goes on to say: "If the losses to the Government exceed this level, the Government will waive its right to recover for damages."

Dr. COOK. That's right.

Mr. NELSON. That's very similar, as I understand it, what is filed in this bill. What's—the bill basically says that there will be a determination as to what is the maximum available amount of insurance and it goes up to a cap of \$100 million for Government property damage. Maximum probable loss is what would be the administrative determination by the DOT under the bill.

Dr. COOK. That's correct.

Mr. NELSON. Now, having heard that do you want any further comment, Dr. Cook?

Dr. COOK. Well, it seems to me that there is considerably more flexibility in the provisions that you just read with regard to the Secretary of Transportation setting that amount under the particular circumstances that you're going to encounter.

Mr. NELSON. All right.

Dr. COOK. That being the case, then yes, if it exceeds that, then we're liable for above that.

Mr. NELSON. Okay.

Dr. COOK. And what I'm saying is that that could be considerably different I think than the maximum of \$100 million which appears in this.

Mr. NELSON. Okay. I think your point of view now is clarified, and it will be interesting to hear what the satellite manufacturers and the manufacturers of the rockets say tomorrow with regard to the certainty that they need so that they can go out and obtain the insurance to cover them on this property damage liability.

All right. Mr. Andrews, are you finished in your line of inquiry?

Mr. ANDREWS. I'm through, Mr. Chairman. Thank you.

Mr. NELSON. Mr. Walker?

Mr. WALKER. Thank you, Mr. Chairman.

Mr. Stadd, let me go back to a part of your testimony that for time reasons you didn't cover, but I think it helps provide a framework here for some of what we're talking about and I want to highlight this.

You say in your testimony that General Dynamics is reportedly selling its commercial Atlas-Centaur for about \$59 million. That's a pretty firm figure, is it?

Mr. STADD. That's based on what I hear from the marketing people; yes, sir.

Mr. WALKER. And yet that firm sold the same vehicle to the U.S. Navy just a couple of years ago for \$80 million?

Mr. STADD. Again, that's what I'm told; yes.

Mr. WALKER. Twenty-six percent more. And so the implication there is that in the commercial marketplace we could in fact buy now a launch service from General Dynamics for \$59 million that up until a couple of years ago we were paying \$80 million just for the vehicle?

Mr. STADD. That is the implication; yes.

Mr. WALKER. And the reason for that is largely because of all of the paperwork overload that the Federal Government has imposed upon launchers of vehicles up until this point; is that right?

Mr. STADD. That is correct—in part. Another dimension to that is that when you are selling a vehicle, if you will, to the Government oftentimes NASA, or in this case the Navy, will have additional mission requirements that add some to the price. But I would support the thrust of your position.

Mr. WALKER. So it's similar to the fact that if we wanted to fly a load of supplies aboard a 747 of forcing them to document every operational feature of the 747 before we'd let a Government load go aboard it is what we do and thereby increase the cost of any shipment aboard that vehicle.

I make the point only for this reason. I agree with you that I think it would be a mistake for this subcommittee to move in the direction of taking language out of the original Commercialization Act that allows your Department to promote this kind of activity. I think we would make a very, very grave mistake in moving ahead on the commercialization to suggest that there should not be an advocate for that kind of thing within the Federal Government. And when you're talking about 26 percent greater cost on one vehicle, one known quantity, it seems to me that what we want to be doing is promoting the idea of lowering the cost through commercialization rather than leaving that to people who may not be particularly enthusiastic about moving into the commercial sector. And so I think that part of your testimony makes the case for having the original language with regard to promotion kept in this particular bill.

Let me pose the question that I think Mr. Perkins explored pretty well and the chairman has come back to because I think it's important for us to understand the parameters of what we're getting into here. I think you understand from what the chairman is saying and from what Mr. Perkins is saying that we've got a problem, and that is, if we move your legislation which largely has tort reform provisions in it, that is not a piece of legislation that can be kept jurisdictionally within the confines of this committee. That that has to move to other jurisdictions which have been decidedly unenthusiastic about any kind of tort reform in the past, so that probably dooms the chances for any kind of legislation emerging from this Congress dealing in this area, which leaves the industry without any direction.

On the other hand, it is my understanding that within the Administration there has been considerable controversy about this

subject as well. That we run the risk that if we do not include the provisions on tort reform that are included that indeed the Department of Justice, which has considerable say in this, might recommend a veto of this legislation should it get to the President's desk, which would also doom the chances of it, and we would still end up with the industry without any kind of guidelines.

Mr. STADD. You have just succinctly characterized my life for the past—

Mr. WALKER. Well, I guess my question is, how do we work ourselves out of that dilemma? Because it appears at the very least we need to move forward. Let me do it this way with this question. If the choice is between no legislation emerging from Congress and the piece of legislation that we can probably get through this committee and get out on the floor and possibly past the Congress, or getting nothing, what's your choice? Should we go ahead and do something?

Mr. NELSON. Just say mumbo-jumbo. [Laughter.]

Mr. STADD. Mr. Chairman, you always ask me to explain what I really meant by those words. That's what I'm afraid of.

Let me respond this way, if I may. Our industry advisory committee has pressed the Department very hard to develop an approach to bounding the risk. They have asked us to push a regulatory authority to the envelope. I think we've done that. I think we can do that, and I assure you that, although the chairman mentioned earlier that there've been promises in the past in terms of timeliness of various things, that we've said that various things would be brought in on time and I've learned, being on the Government payroll, that sometimes it takes three or four times longer than one would hope. Secretary Burnley has made this a priority, so we're under pressure from him every week. They ask where things are.

In the area of third-party liability, I believe that there is sufficient coverage and capacity out there to cover what I believe will be the maximum probable loss determinations that this Department will need. I'm in a difficult position because as a regulatory body I can't sit here in the public fora and prejudge the outcome of our insurance determinations.

Mr. WALKER. Sure.

Mr. STADD. But I do believe that will be the case. In fact, we're close to announcing an assurance determination for Conatec and I think that that determination will be well within the premium envelope that is affordable for that applicant.

The third-party claims history in this industry has been impeccable. It's a tribute to the range operators these past 30 years, and it's a tribute to the fact that we have extremely reliable launch systems.

I believe that the 13 or so contracts, the bulk of which are with foreign operators, that have been signed to date with American launch firms is testimony to worldwide recognition that American launch systems have reliability bar none. And I think that that combined with some remedial measures which are available out there, such as pooling of insurance, although we're just beginning to explore this, I understand that the Congress did pass back in 1986 a mechanism that does allow industry sectors to pool and re-

insure and invest insurance income and so forth, that this may be one mechanism for dealing with excess coverage.

So as an Administration official asked that question, I respond that I think that there is adequate capacity and coverage available and I do think there are remedial mechanisms in place that can help bound this excess coverage question over time.

Mr. NELSON. Mr. Walker, would you yield?

Mr. WALKER. Sure. Be glad to yield.

Mr. NELSON. I want to extend an invitation to you, Mr. Stadd—

Mr. STADD. Yes, sir.

Mr. NELSON [continuing]. To be a part of our panel tomorrow in the hearing when we will have the manufacturers of the rockets as well as the satellite manufacturers here.

Mr. STADD. Okay.

Mr. NELSON. And I want you; you'll become a part of the witness list tomorrow.

Mr. STADD. All right, sir.

Mr. NELSON. And I want you to have a direct opportunity to say what you just said—

Mr. STADD. Okay.

Mr. NELSON [continuing]. With them singing a completely different tune, which is that they need some indemnification. That they can't go out and buy the liability insurance to cover the worst case scenario and still be competitive.

Mr. STADD. Okay.

Mr. NELSON. Thank you, Mr. Walker, for yielding.

Mr. WALKER. Surely.

Well, if I do read, though, what you've said, there is no doubt that the industry wants some action—

Mr. STADD. Um-hum.

Mr. WALKER [continuing]. On this issue.

Mr. STADD. Absolutely. Yes.

Mr. WALKER. Is that a correct conclusion?

Mr. STADD. That's correct.

Mr. WALKER. And so therefore, if Congress came to the conclusion that the action we are potentially going to be able to do is in fact that which the subcommittee has drafted with some revisions, then we would certainly be moving in the direction of the industry to go ahead and take some action. Is that a correct statement?

Mr. STADD. That's correct; yes.

Mr. WALKER. Well, Mr. Chairman, that's all I have. Thank you.

Mr. NELSON. Other questions from the committee?

Mr. O'Brien, section 5(b) you suggest as inappropriate Government control or sequencing of launches by the private sector. Is the DOD already controlling these launches?

Mr. O'BRIEN. I think maybe Charley Cook ought to answer that. Do you know, Charley? I'm not sure that we've reached that point yet, where you can say that that's been accomplished. Charley, do you? I don't think we have.

Mr. NELSON. All right. In your statement, Mr. O'Brien, page 6, I quote from the middle paragraph of the page:

"Also, with regard to section 5(b), consistent with the policy which removed a number of satellites from the Shuttle, a number

of companies have signed or are pursuing launch service agreements with the private sector. I believe it would be an inappropriate role for the U.S. Government to control or sequence launches by the private sector under section 5(b). In addition, the Shuttle manifest was developed based upon Shuttle resources and schedules in contrast to the private company resources and schedules."

Mr. O'BRIEN. Right. You asked me a question, whether the Air Force is controlling, and I don't know the answer to that. But in response to your reference to my testimony, or the prepared statement at least, I think this goes to what Dr. Cook was saying in his statement about the priority issue and the scrambling up of Government launches with purely commercial launches, what it might mean from the standpoint of subsidizing foreign payloads through a priority procedure, and also I think his comment is relevant with respect to protecting the national interest priorities might well also influence the scheduling activities. And that's all that I think we were getting at here. But, to the extent that that's all been worked out, it has not.

Mr. NELSON. So you're saying the Government is already controlling these launches?

Mr. O'BRIEN. The Government is in control, yes, from that standpoint. Of course.

Mr. NELSON. You're saying they're controlling it but it's inappropriate for them to control it; is that what you're saying?

Mr. O'BRIEN. Under section 5(b) I'm saying that I think it's inappropriate. I didn't say it's inappropriate for the Government under some procedure to do it. I'm referring to 5(b) only here.

Mr. NELSON. Why don't you submit any further clarification on this for the record?

Mr. O'BRIEN. Sure. Of course.

Mr. NELSON. Mr. Stadd, the new space policy announced a few days ago directs that NASA and DOT will provide to research payload owners—and I'm quoting here: "NASA and DOT will provide to research payload owners manifested on the Shuttle a one-time voucher that can be used to purchase an alternative U.S. commercial launch service."

You want to elaborate on this, and who would be the beneficiary of such a voucher program?

Mr. STADD. Well, the intention is for us to work with NASA to see if there are principal investors or owners of these secondary payloads who due to backload or schedule uncertainty or whatever may have an interest in securing an alternative ride to space, and the whole genesis of this initiative was to see if something innovative like a voucher might be worth looking at. There's no funding attached to it and the intent is to explore it; get together, see if there in fact—is in fact a universe of people that might have an interest in this. Mr. Chairman, it may be a moot issue. On the other hand, we may find some need for it. In that case, we would make some recommendations to this committee how that might be addressed.

Mr. NELSON. So you're saying there are no budgetary consequences to this voucher program?

Mr. STADD. With that current initiative, there's no money attached to it. Clearly, if we pursued a voucher concept, there would

be budgetary implications. At this point we're really just at the exploratory phase.

Mr. NELSON. Why would a commercial provider provide a free launch?

Mr. STADD. No, it would not. The intent—first of all, we have to go back to the first principles to see if, in fact, there's any need for amongst, as I say, payload owners in the secondary market area for rides. If there are people that are satisfied with the queueing and with the manifesting and are not looking elsewhere, then it's a moot point. On the other hand, if we have some payloads that are compatible and can fly on ELV's, then one of the mechanisms we would take a look at would be a voucher, and then, Mr. Chairman, then we'd have to, obviously, quantify the potential use of a voucher, how much money would be attached. But that would be the second phase of such an initiative.

Mr. NELSON. You think that would have a profound effect on NASA's joint endeavor program?

Mr. STADD. I don't anticipate that at all, no.

Mr. NELSON. Dr. Cook, Air Force presently charges industry between \$1 and \$2 million per commercial vehicle for quality control inspection. What are those charges for?

Dr. COOK. The provisions that we have I believe are that the commercial vendor will request the quality assurance control from us—

Mr. NELSON. Can you pull that microphone down just a little bit, please?

Dr. COOK. The provisions are, I believe, that the commercial launcher, launch provider will request to the Air Force that these services be provided; and that being the case, then we will provide them. And what that does is it covers our expenses for having people go out into their plant and conduct those quality assurance checks. But we only do that upon their request and if it is deemed to be of interest mutually to both of—the Air Force and to the commercial vendor.

Mr. NELSON. And only at their request?

Dr. COOK. And only at their request.

Mr. NELSON. All right. Can you give for the record the person in your Department or office in your Department for the commercial launch industry?

Dr. COOK. Let's see. Could you help me a little bit? I'm not sure—

Mr. NELSON. OK. Your statement says that "We have a single point of contact in the Department of Air Force." Who is that? Where are they located? And what is their telephone number?

Dr. COOK. The single point of contact within headquarters is myself. It's my office. My telephone number is 695-2317.

Mr. NELSON. Okay.

Dr. COOK. We have as well focal points within our Systems Command and within our Space Division, so that we're focal within the sub-organizations. But I am the focal point within the Air Force.

Mr. NELSON. Dr. Cook, in September, the Air Force had said that they would make reasonable efforts to accommodate the commercial launches on the ranges, and your statement here today suggests that Congress should consider a "sense of the Congress" state-

ment—and this is a quote—“sense of the Congress statement that Air Force make the best efforts to minimize schedule disruptions.”

Now, is such a “best efforts” commitment now reflected in your agreements with the industry? All right. What—

Dr. COOK. I may have to—

Mr. NELSON. All right, I'll tell you what, at the very least what I would like is that you said that the revised launch services agreement has just been released today. So we will make that a part of the record and we will enter that in the record if you will submit that.

Dr. COOK. All right.

[The revised expendable launch model agreement is included as Appendix 2.]

Dr. COOK. Can I provide the other, the answer to your question for the record?

Mr. NELSON. Yes.

[The information is contained in Appendix 2.]

Mr. NELSON. Well, on the basis of your revised agreement today, would it be accurate to state that the commercial launch scheduling is now done—will now be done on a first-come, first-served basis?

Dr. COOK. Well, I think that's hard to, that's very hard to quantify exactly. I think that will be the overall intent, but when you're talking about different launch pads, different vehicles, and trying to integrate those all into some kind of a range schedule, I think it's hard to guarantee that first come, first served. We have to put together a manifest that makes the most sense under the circumstances which you're dealing with, but I think certainly that's the intent.

Mr. NELSON. All right. Mr. Stadd, let me ask you, you have testified there are 13 signed contracts between commercial launchers and users?

Mr. STADD. Yes, sir.

Mr. NELSON. And you said they start in 1989?

Mr. STADD. That's correct, sir.

Mr. NELSON. All right. Now what Government steps must be taken before these launches can take place?

Mr. STADD. From the Department's standpoint, we have to run our traps as far as launch safety review. Congress has given us 180 days to do that, and that means that, if I can use the Conatec license as a precedent in that regard, we work closely with the Kennedy Space Center people, Air Force people at Patrick, and in working with them to ensure that all the adequate launch safety, range safety procedures and requirements are in place and that the applicant is meeting them. Then we, as far as the insurance determination is concerned, we are approaching that on a case-by-case basis.

I should be very clear that to date we've been able to successfully deal with the insurance requirements on a case-by-case basis working closely with the Air Force and NASA. And again assuming that this all assumes that range-use agreements are in place, which is the one fundamental hurdle that's had to be crossed by the applicants, that's essentially the trapline that has to be run by the applicants before they begin their launches in '89.

Mr. NELSON. I want you to ponder this over the night and then when we get together tomorrow with the manufacturers we can talk about it. It has been clearly stated to us in our hearings last fall and in our private visitations with this industry that they are, American satellite companies are reluctant to sign up. And whereas you have presented this that it's a measure of success that there are 13 contracts that are held, yet we continue to get these kinds of statements and vibrations that there's a lot, lot more to be done. So we'll just visit that issue tomorrow.

Are there any further questions by members of this panel? Gentlemen, thank you. It's been constructive. Now I want you to leave here today understanding the thrust at which we are approaching this whole subject. I mean, there is no lack of commentary about something that needs to be done. Now I don't care who gets the credit for it. I just happen to be in this position as the chairman of the subcommittee, but we want to get something moving so that we can get this industry underway and quit dragging our feet.

Now I think this policy announced is a step in the right direction. I think over the course of these hearings, as we try to massage this legislation we are going to see what's substantial in the legislation and, if different, what's substantial in your announced Administration policy. But it is not the intention of this subcommittee that we're going to get ourselves hung up on ideology and get ourselves bogged down where we can't move something that's clearly in the interest of this Nation in getting those rockets off the pad with commercial payloads.

And so I want all of us in that spirit of cooperation. Let's don't go at it that it's Air Force versus NASA or Air Force versus DOT or you guys versus the committee. Let's go at it to try to come together and build a consensus and move it. And don't give us this nonsense about well we're going to threaten a veto and all that stuff. We've got to work that out ahead of time.

Now the fact is we can always wait until next year when there's a new Administration. But I don't want to wait until next year because we're losing valuable time. So let's see if we can't move in a spirit of cooperation and consensus-building, in a bipartisan fashion in which this committee operates, as you well know, and see if we can't come out with something.

Dr. Cook, there was a UPI story that said—this is dated February the 7th—that the Air Force is studying whether to expand a Shuttle launch safety zone. Naturally, at home this has gotten all kinds of press. It's a move that would keep reporters and other folks that would be down there watching the next Shuttle launch from the existing press site.

Do you have any comments or any questions or anything that you would like to state for the record with regard to the Air Force considerations? I assume that this will ultimately be a NASA decision, not an Air Force decision. But the Air Force, as I understand it, is going to be making the recommendations. Would you shed any light on that for us?

Dr. Cook. Well, the implication I think that I detect in the question is, is this directed towards keeping any segment of the population out of there, and I can assure you that is not the case.

Mr. NELSON. Well, that's not the implication of the question. The question is you all have made some kind of comment or recommendation to NASA with regard to a security zone, and I'd like to know——

Dr. COOK. I have not been involved directly myself, but that's my understanding. Yes.

Mr. NELSON. All right. You want to submit that for the record?

Dr. COOK. And it's been based on safety considerations. And yes, if I may expand on that for the record, I'd like to do that.

[The information referred to is contained in Appendix 4.]

Mr. NELSON. Mr. O'Brien.

Mr. O'BRIEN. Yes. Could I comment on that?

Range safety, going back to the Webb-McNamara agreement of many years ago, is within the purview of the Air Force. We do not have the range safety function in NASA. There is a serious set of considerations under review within the Air Force and I think shortly we will be in joint discussions on just where the limit lines ought to be drawn in the future, and that will have to be resolved, obviously, before the August launch. But that's being worked diligently on both sides.

Mr. NELSON. All right. Let me just suggest that there are a lot of other considerations that have to go into this and I assume you all are going to be taking them under consideration. I mean, this event that's going to occur on or about August 4th is going to be an event that is going to be with the most intense interest. That the entire world is going to be looking and there are just interests there that need to be protected with regard to that inquiry and that ability to watch. So that's on one hand.

On the other hand, you know, if there are legitimate safety concerns as there were 3 or 4 years ago, and which one of the sites was moved from a position of about 3 miles to a position in excess of 3½ miles away because of the possibility of gases floating if the wind patterns were correct. So we want to hear your response. This committee wants to hear that.

Any further comments from you, gentlemen? Thank you very much. We will call up the next panel.

Mr. NELSON. Let's move on. We have Mr. Dan Cassidy, representing the AIAA, and Mr. William English, also representing the AIAA. So we will proceed. Mr. Cassidy?

Please summarize your statement. The full statement will be put in the record.

STATEMENTS OF DANIEL E. CASSIDY, CHAIRMAN, TECHNICAL COMMITTEE ON LEGAL ASPECTS OF AERONAUTICS AND ASTRONAUTICS, AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, WASHINGTON, DC; WILLIAM D. ENGLISH, CHAIRMAN, SUBCOMMITTEE ON ALLOCATION OF SPACE LAUNCH RISKS, AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, WASHINGTON, DC

Mr. CASSIDY. We have provided copies of the AIAA position paper, titled "U.S. Commercial Space Transportation Risk Allocation and Insurance."

I'm sure the subcommittee is familiar with the AIAA. The American Institute of Aeronautics and Astronautics is a nonprofit technical professional society with over 40,000 members who are engineers, scientists and other professionals engaged in every sector of the aerospace profession from industry to government to the universities.

For the purpose of furthering scientific and technical advancements, there are approximately 54 technical committees, of which the Legal Aspects of Aeronautics and Astronautics is one. Just to state for the record, Mr. Chairman, the objective of the Legal Aspects Committee is to foster an understanding of legal areas uniquely related to aeronautics and astronautics and space science technology. These areas include national and international space law, legal systems protecting intellectual property, and the laws governing satellite communications, remote sensing of the earth's resources, and the commercial use and industrialization of space.

Now, to provide a focal point for the study of one of the major problems facing the U.S. commercial space transportation industry, namely, how to allocate in a commercially reasonable manner the liability risks associated with space launch operation, we formed a subcommittee, and the subcommittee was designated the Subcommittee on Allocation of Space Launch Risks. We believed it was important for the AIAA to investigate and make a statement on this issue.

This subcommittee held extensive discussions with representatives of the U.S. commercial space transportation industry, satellite manufacturers, owners and operators, and the insurance industry, as well as representatives of both the executive and legislative branches of Government. The resulting report, as we've provided, was approved by the Board of Directors as an AIAA position paper. And overall, the position paper examines the nature of the liability risks involved, identifies the problem such risks create, reviews the historic precedents and the current approach of foreign launch competitors in managing these risks, and offers potential alternative solutions, together with key requirements to achieve a solution.

Mr. English is the subcommittee chairman, and he will proceed to review the main points of the position paper.

Mr. NELSON. Welcome, Mr. English.

Mr. ENGLISH. Thank you, Mr. Chairman. Now I will be very brief and summarize the key conclusions of the report, as Mr. Cassidy indicated.

As the report indicates, the launch of any payload, commercial or Government, into space involves the potential for significant damage to persons and property; for injury or damage to the innocent public, those with no involvement in the launch activities, and for injury or damage to persons and property of the Government and the industry involved in the launch process, including the contractors, subcontractors, the launch pad and associated facilities, other Government property at the launch site, and the launch vehicle and satellite payload. The problem is that in any given launch the accumulation of the risk of liability to the public and for damage to Government and property involved in the launch process can well exceed reasonably available insurance. That is the

conclusion of the extensive discussions we had with the insurance industry as well as the other participants in the industry. For some risks no insurance is available, such as latent environmental risks, which under the Air Force contract as presently written, the industry is required to assume.

The Air Force in providing the essential launch support services and facilities has required the ELV industry to assume both the insurable, as well as uninsurable liabilities on an unlimited basis. Foreign launch competitors take a significantly different approach. Third-party liability is underwritten by these competitors through, in some cases, a government-sponsored combination of guaranteed insurance and indemnification in excess of that insurance coverage provided by the launch service providers. This approach cannot be matched by the U.S. ELV industry without seriously jeopardizing the financial viability of the private companies involved.

With respect to liability for damage to launch facilities and associated properties, the foreign launch competitors include comprehensive cross waivers, relieving all parties involved in the launch process from any liability to each other for property damage. Mr. Chairman, it's quite accurate to say that these foreign launch competitors took their cue from NASA. NASA was the originator of this approach. For third-party liability, NASA recognized the requirement for insurance, but it indemnified in excess of the available insurance, as determined by it. NASA also, Mr. Chairman, entered into compulsory cross waivers as a condition to contracting with NASA for the launch services.

The result of the present scheme for expendable launch vehicle providers is that the industry will be financially vulnerable in undertaking commercial launch services and activities. It cannot offer without a bet-the-company risk the unlimited indemnification protection to its customers that foreign launch service providers offer. Consequently, significant uncertainty exists with respect to the longer term viability and competitiveness of the U.S. commercial space transportation industry.

The solution that the AIAA paper recommends is based, first, upon recognition of the distinction between the "probable maximum loss" and the so-called "maximum possible loss" that can arise out of a launch. The former, that is, the probable maximum, is most likely within levels of reasonably available insurance. The latter is that extraordinary incident which would rarely, if ever, occur, but if it does the losses could well exceed available insurance.

Given this distinction between probable maximum and possible maximum, the paper recommends a solution that would protect U.S. Government interests and at the same time be manageable by the U.S. ELV industry. And that is, to allocate the risk between the industry and the Government on what it calls a layered or horizontal basis. The U.S. ELV industry assumes the first layer of risk, covering the probable maximum loss up to the level of reasonably available insurance at no cost to the Government. The Government assumes the second layer of risk, the unlikely maximum possible loss, over and above the reasonably available insurance level.

We believe that this is a reasonable allocation of launch operation risks and it can generate significant benefits, not only in the development of a strong and economically viable ELV industry which will provide the foundation for an assured access to space needed to meet our country's goals in space, it will provide also a very substantial insurance protection for the U.S. Government in terms of its exposure to third-party liability as well as for damage to its property, and do so at no cost to the Government.

It will also, we believe, be an attraction to American industry in utilizing space for commercial purposes to the benefit of our international balance of trade and to the Government, which will be able to purchase launch services for its own needs at lower unit prices.

In sum, the United States, its taxpayers and the commercial space industry will mutually benefit from a reasonable and fair allocation of space launch operations risks. We believe the principles and policies of the AIAA paper are reflected in H.R. 3765, Mr. Chairman.

Thank you.

[The statement of Messrs. Cassidy and English and the AIAA Position Paper follows:]

PRESENTATION TO
THE SUBCOMMITTEE ON SPACE SCIENCE
AND APPLICATIONS
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
UNITED STATES HOUSE OF REPRESENTATIVES
OF THE
AIAA POSITION PAPER
ON
"U.S. COMMERCIAL SPACE TRANSPORTATION
RISK ALLOCATION AND INSURANCE"

BY
DANIEL E. CASSIDY
AND
WILLIAM D. ENGLISH

February 16, 1988

American Institute of Aeronautics and Astronautics
370 L'Enfant Promenade, S.W., Washington, D.C. 20024

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FEBRUARY 16, 1988

We are pleased to appear before you today to present to the Subcommittee a summary of the AIAA's Position Paper, "U.S. Commercial Space Transportation: Risk Allocation and Insurance". Copies of the full text of the Position paper have been provided to the Subcommittee.

The American Institute of Aeronautics and Astronautics is a non-profit technical professional society with over 40,000 members who are engineers, scientists, and other professionals engaged in every sector of the aerospace profession from industry to government to the universities.

To further scientific and technical advancement, we have 54 technical committees covering every aspect of the aerospace profession. We represent the AIAA Technical Committee on the Legal Aspects of Aeronautics and Astronautics and its Subcommittee on Allocation of

Space Launch Risks. The objective of the Legal Aspects Committee is to foster an understanding of legal areas uniquely related to aeronautical and space science and technology, including national and international space law, the legal systems protecting international property, and the laws governing satellite communications, remote sensing of the earth's resources, and the commercial use and industrialization of space.

To provide a focal point for the study of one of the major problems facing the U.S. commercial space transportation industry -- how to allocate in a commercially reasonable manner the liability risks associated with space launch operations -- the Legal Aspects Committee created a special Subcommittee on Allocation of Space Launch Risks. The Subcommittee held extensive discussions with representatives of the U.S. commercial space transportation industry, satellite manufacturers, owners and operators and the insurance industry, as well as representatives of both the Executive and Legislative branches of the Government. Its report, in the form of an AIAA Position Paper, was approved by the Board of Directors of the AIAA and published in January of 1988. The Position Paper examines the nature of the liability risks involved, identifies the problem such risks create, reviews the historic precedents and the current approach of foreign launch competitors in managing these risks, and offers potential alternative solutions, together with key requirements to achieve a solution. As the Position Paper has been made available to the

Committee, as well as to the public, we will briefly summarize its principal points.

As with any new industry, the commercial space transportation industry has a number of problems it must face and overcome to be successful. There is, however, one major problem that is beyond the ability of the industry to solve by itself, and which if left unresolved could make the long-term provision of space launch services on a commercial basis by American companies economically impractical and commercially inadvisable. This is the problem of how to allocate in a commercially reasonable manner the risks associated with space launch operations.

The launching of any payload into space by means of a vehicle carrying tons of explosive propellants involves the potential for significant damage to property and injury to people. While these risks may be reduced by sound launch operations management, they cannot be eliminated. The nature of these operations thus exposes both the U.S. Government and the commercial provider of space transportation services to very significant potential liabilities and monetary losses in the event of a launch mishap. Liability may arise not only for direct damage caused by the launch operation but also for indirect or "consequential" damages associated with a mishap, such as monetary damages for the loss of use of property while it is being repaired or replaced.

In any given commercial launch, the accumulation of these risks of liability for third-party bodily injury and property damage, and for damage to Government property and personnel, can easily exceed the maximum amount of insurance coverage available on the world market at reasonable cost. Launch activities also carry some risks for which no insurance is available today on the world market, such as latent environmental hazards.

This uninsurable risk potential is highlighted by the terms of the U.S. Air Force Model Expendable Launch Vehicle Commercialization Agreement which requires the commercial launch operator to assume both the insurable and uninsurable risks of liability to third parties and for damage to Government property that may result from a launch. The result is that the U.S. commercial space transportation industry, as it is attempting to gain momentum and financial viability, and thereby contribute to restoring our Nation's assured access to space, finds itself financially and institutionally vulnerable. One catastrophic launch accident could leave a launch company facing a billion dollars of liability claims over the maximum amount of available insurance. It is unlikely that any commercial industry can, on a continuous basis, provide unlimited indemnification protection both to its customers and, in some cases, to the U.S. Government without running substantial, and potentially disabling, financial risks.

To foster and encourage a U.S. commercial space transportation industry that can compete effectively with European and other non-U.S. launch service providers, it is necessary to develop a commercially-tolerable approach to the allocation of these launch operations liability risks. The solution recommended is to allocate these liability risks on the basis of those that are commercially insurable at reasonable premiums, as determined by governmental authority, and those that are in excess of such insurance capacity. The prescribed reasonably-available insurance would be paid for by the commercial sector, with the Government as a cost-free named beneficiary, and the very low probability excess-of-insurance liability risks would be assumed or otherwise contained by the U.S. Government.

Such a distribution of launch liability risks is essential to encourage and promote a vigorous and competitive commercial space transportation industry, particularly in the initial phase of its efforts to regain U.S. leadership in space transportation.



U.S. COMMERCIAL SPACE TRANSPORTATION RISK ALLOCATION AND INSURANCE

An AIAA Position Paper

*Submitted by the
AIAA Technical Committee on Legal Aspects
of Aeronautics and Astronautics
Prepared by the Subcommittee
on Allocation of Space Launch Risks
and Approved by the AIAA Board of Directors*

January 1988

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**U.S. COMMERCIAL SPACE TRANSPORTATION
RISK ALLOCATION AND INSURANCE**

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Summary and Conclusion

A commercially viable U.S. space transportation industry is essential to a viable and competitive U.S. space industry.

Space transportation involves the potential for significant risks of damage to property and injury to people. Although a significant portion of these risks should be insurable at reasonable cost, the so-called maximum possible launch incident could result in third-party liability claims, as well as damage to Government property, well in excess of available insurance capacity.

The assumption by the U.S. commercial space industry of such an uninsurable maximum possible liability exposure constitutes a potentially disabling financial burden.

To foster and encourage a U.S. commercial space transportation industry that can be effectively competitive with European and other non-U.S. launch service providers, it is necessary to develop a commercially-tolerable approach to the allocation of these launch operations liability risks. The solution recommended in this paper would allocate these liability risks on the basis of those that are commercially insurable at reasonable premiums, as determined by governmental authority, and those that are in excess of such insurance capacity. The level of reasonably-available commercial insurance would be prescribed by the Government, taking into account applicable risk factors, and paid for by the commercial sector with the Government as a cost-free named beneficiary. The excess-of-insurance liability risks would be assumed or contained by the U.S. Government, either through indemnity, a cap on liability or, possibly, some combination of Government-provided insurance of last resort and indemnity or cap of liability in excess of the insured risk.

Such a distribution of launch liability risks is essential to encourage and promote a vigorous and competitive commercial space transportation industry, particularly in the initial phase of its efforts to regain U.S. leadership in space transportation.

I. Introduction

The United States must have an assured means of access to space if we are to achieve our national security and commercial space program goals. An assured means of access to space on reasonable terms and with a commercially manageable approach to the allocation of certain risks of liability is the sine qua non for a viable and competitive U.S. commercial space program.

For more than a quarter century, the United States enjoyed continuous access to outer space. This assured access provided our country with many benefits in areas such as national security, the balance of trade, technical

and scientific leadership, national prestige, and enhanced economic development. Sole reliance was placed on the National Aeronautics and Space Administration (NASA) to provide access to space for civil government and commercial missions. The Challenger accident changed all of this.

Since the Challenger accident there has been a major reassessment of the means for satisfying America's future space transportation needs. In order to broaden the base of available space transportation systems and guarantee that our country will never again lose—even temporarily—its "assured access to space", private industry has been encouraged by a major shift in Government launch policy to accept the challenge of providing launch services to customers on a commercial basis. At least five U.S. companies have already accepted this challenge, and the first of a potentially large number of commercial launch services agreements has already been signed.

As with any new industry, the commercial space transportation industry has a number of problems it must face and overcome to be successful. There is, however, one major problem that is beyond the ability of the industry to solve by itself, and which if left unresolved could make the long-term provision of space launch services on a commercial basis by American companies economically impractical and commercially inadvisable. This is the problem of how to allocate in a commercially reasonable manner the risks associated with space launch operations.

This paper identifies the critical policy issues and suggests solutions for achieving a viable and competitive long-term commercial space launch industry and for furthering in the national interest an assured access-to-space capability necessary to a strong U.S. space program.

II. Background

NASA provided such access to space on a routine, cost-reimbursable basis for more than 20 years, first with expendable launch vehicles and then with the Shuttle. This was accomplished using a proven risk management framework where the level of risk borne by the commercial parties did not exceed the amount of available insurance at commercially reasonable premium rates.

To achieve this result, NASA and the commercial parties allocated the risks involved in the following manner: NASA required, generally, the commercial party to obtain the maximum available third-party liability insurance at reasonable cost, with the Government as a named insured to protect it, at no cost, against any such claims that might arise out of the launch process. In return for this free coverage, the Govern-

ment, pursuant to Section 308 of the NASA Act, assumed responsibility for third-party liability risks in excess of the commercially available insurance limits. This industry-Government risk management solution apportioned the risk in such a manner that the commercial party which benefited from the launch was responsible, through insurance coverage, for what was considered the probable maximum loss, with the Government assuming the potential but extremely unlikely excess-of-insurance liability risk of the maximum possible loss.

A series of U.S. policy decisions over the past three years has shifted responsibility for providing space transportation to commercial users to the private sector, but without making this private insurance/Government indemnity risk allocation approach, or some variation, available to the new commercial space transportation providers. These decisions are embodied in: (1) Executive Order 12465 of February 24, 1984, designating the Department of Transportation as the lead Government agency to encourage and facilitate commercial expendable launch vehicle activities; (2) the Commercial Space Launch Act of 1984 (Public Law 98-575), which codified E.O. 12465 and also gave the Office of Commercial Space Transportation the responsibility to license and regulate the activities of the U.S. commercial launch operators; and (3) the President's August 15, 1986 Statement announcing the Government's intention to rely on the private sector as the primary source for furnishing U.S. launch services for commercial and foreign satellites. This statement announced that NASA would no longer be in the business of launching commercial satellites, with the exception of those that are Shuttle-unique.

Following the August 1986 statement, several Government agencies, including the Department of Transportation, the Department of Defense and NASA, undertook important actions to support the development of a U.S. commercial launch industry. Primary among these were necessary actions under the provisions of the 1984 Act to permit the U.S. industry to utilize certain Government-owned and operated launch facilities and services that were essential to support the industry's commercial space transportation efforts.

A critical step in achieving a viable and competitive U.S. launch industry is the development and execution of appropriate agreements between the Government and each of the commercial launch operators for use of these Government facilities and services on fair and reasonable terms. As with any agreement of this nature, an important feature is the allocation of risks among the parties—in this case the commercial industry and the Government. Although the Air Force has issued a "model agreement" and at least one commercial launch

operator has signed such an agreement, critical policy issues concerning the allocation of risks in the event of potential catastrophic third-party liability claims and of loss or damage to Government facilities remain to be satisfactorily resolved.

III. The Risks and Potential Liabilities

The launching of any commercial or government payload into space by means of a vehicle carrying several hundred tons of explosive propellants involves the potential for significant damage to property and injury to people. While these risks may be reduced by sound launch operations management, they cannot be eliminated. The nature of these operations thus exposes both the U.S. Government and the commercial provider of space transportation services to very significant potential liabilities and monetary losses in the event of a launch mishap. Liability may arise not only for direct damage caused by the faulty launch operation but also for indirect or "consequential" damages associated with the mishap, such as monetary damages for the loss of use of property while it is being repaired or replaced.

There are two classes of liability which may arise from a launch accident:

"Third-Party" Liability: This is legal liability to those individuals, corporations or other entities who had no involvement in the launch activities. Examples of such liability would include property damage suffered by a property owner when part of an errant launch vehicle, destroyed for range safety reasons, falls on his property, or injury to individuals or live-stock resulting from the breathing of toxic fumes from the propellants of a destroyed launch vehicle.

"First and Second-Party" Liability: This is liability for injury or damage to employees and property of the Government and/or the commercial space transportation provider resulting from the launch process. One example of such liability would be the destruction of Government launch facilities caused by the explosion of a launch vehicle on or near the launch pad. This type of liability potential extends to the contractors and subcontractors of the Government and the commercial launch company, and its payload customer, and covers the launch pad, associated facilities and other Government property at the launch site (and that of the Government's contractors and subcontractors), the launch vehicle, its associated upper stages and the other property of the launch provider and its contractors and subcontractors, and the satellite payload(s).

IV. The Problem

In any given commercial launch, the accumulation of risks of liability for both third-party injury/damage

and for damage to Government or private property can easily exceed the maximum amount of insurance coverage available on the world market to the commercial launcher at reasonable cost. Launch activities also carry some risks for which no insurance is available today on the world market, such as latent environmental hazards.

Although the total accumulation of risks associated with a launch can well exceed the maximum level of reasonably-available insurance on the world market, insurance industry sources indicate that substantial commercial liability insurance capacity, at reasonable premiums, can be obtained under appropriate circumstances. Previous experience indicates that third-party liability insurance in the range of \$500 million per launch may be secured worldwide. There is also, potentially, a substantial amount of insurance capacity to underwrite the risk of damage to U.S. Government property. Nonetheless, the "maximum possible" damage to Government property and to third parties that could result from a U.S. commercial launch could exceed even these substantial levels of insurance capacity. There is no certainty, however, that such significant amounts of insurance can be secured or maintained at the time of a commercial launch. This uninsurable risk potential is highlighted by terms of the U.S. Air Force Model Expendable Launch Vehicle Commercialization Agreement which requires the commercial launch operator to assume both the insurable and uninsurable risks of liability to third parties and for damage to Government property that may result from a launch.

V. Historic Risk Allocation Precedents

Historically, NASA, as the principal provider of U.S. launch services to the commercial sector until the Challenger tragedy, took a quite different approach to the allocation of the risks associated with a commercial launch from that embodied in the Air Force model agreement. As noted above, pursuant to special legislative authority, NASA, as a general rule, required the purchaser of the Government-provided launch service to acquire at no cost to the Government a prescribed level of third-party liability insurance to protect the Government, in return for which NASA indemnified the purchaser to the extent total liability exceeded the available insurance; a commercially reasonable quid pro quo.

With respect to the potential for damage to Government property that might arise out of a commercial launch, NASA waived any right to claim against the party procuring the launch service. In fact, a comprehensive scheme of cross-waiver of rights to recover for damage to the properties of both the Government and the party ordering the launch services, as well as that of

their respective contractors and subcontractors, was required by NASA.

VI. Foreign Competition

Foreign launch competitors have in their launch services arrangements with their customers consistently followed the NASA precedent. The risk of third-party liability beyond available levels of insurance is assumed by these competitors through a combination of customer-provided or paid-for insurance, in some cases with guaranteed availability and cost, coupled with indemnification in excess of the available insurance coverage. With respect to the potential for damage to launch facilities and associated properties, these foreign competitors follow the NASA precedent of comprehensive cross-waivers which relieve all of the parties involved in the launch activity, both Government and private, of any liability to each other for damage to their respective properties.

VII. Results

The emerging U.S. commercial launch industry is today compelled to accept these risks to avoid losing a large amount of potential business. In so doing, the industry is assuming the very low probability but nevertheless uninsurable "maximum possible" risks, both under the Air Force model contract and in launch services arrangements with their customers. The result is that the U.S. commercial space transportation industry, as it is attempting to gain momentum and financial viability and thereby contribute to restoring our Nation's assured access to space, finds itself financially and institutionally vulnerable. One catastrophic launch accident could leave a launch company facing a billion dollars of liability claims over the maximum amount of available insurance. It is unlikely that the commercial industry can, on a continuous basis, provide unlimited indemnification protection both to its customers and, in some cases, to the U.S. Government without running substantial, and potentially disabling, financial risks. As a result, Boards of Directors could with some justification decide that the return is no longer worth the continuing risk to the capital structure of their respective companies.

VIII. Potential Alternative Solutions

In order to manage and distribute the risks associated with commercial space launch operations, it is necessary to distinguish: (1) "probable maximum" loss from (2) the "maximum possible" loss that can arise from a launch. The probable maximum loss is most likely within the amount of reasonably available liability

insurance. The maximum possible loss involves that extraordinary incident which rarely, if ever, occurs. The conceptual maximum possible loss will likely exceed available liability insurance at reasonable cost.

To protect the interests of (1) the third party, i.e., the general public, (2) the Government, and (3) the payload owner, manufacturers and the provider of space launch services, it is proposed that the risks between the industry and the Government (on behalf of the general public) for third-party liability and damage to Government property be allocated on a layered or "horizontal" basis. As now required under the Air Force model agreement, the commercial space launch services provider would assume responsibility for the first layer of risk, up to the maximum amount of reasonably available liability insurance, at no cost to the Government, with the Government, as well as the customers and contractors and subcontractors of the launch services provider, as named insured. This insurance could provide the following types of coverage, with the specific amount of insurance per launch to be determined by the Government, taking into account the risk characteristics of the particular launch vehicle and other related factors:

- (1) Third-party liability insurance, which would cover any reasonably foreseeable loss to the public, based upon the experience of the past 30 years of launch vehicle operation by all nations.
- (2) Insurance for damage to Government property, which would be payable to the Government as a named insured.

Assuming significant levels of insurance capacity are available, the total probable maximum risks of third-party liability and damage to Government property would most likely be covered; the space launch services providers, their contractors, subcontractors and customers, and the U.S. Government are "named insureds" against this probable maximum loss by insurance paid for by the commercial users. The second layer of risk, that which could not be commercially insured at reasonable cost, would then be assumed or contained by the Government pursuant to existing or new legislative authority, as necessary, or, alternatively, limited by law or treaty to prescribed levels of total industry exposure. The United States taxpayers, who have derived and will continue to derive benefits from a successful and viable U.S. commercial space effort, will benefit by the protection afforded by the insurance coverage obtained at no cost to the Government against probable losses, in return for which the commercial users should be protected from potential disabling liability which could undermine the continued availability and expansion of these programs. Such a distribution of risk seems reasonable and fair to all concerned:

the Nation, the taxpayers and the emerging commercial launch industry.

The mechanism by which the Government would assume, or contain, the commercially uninsurable risk is not specifically dealt with in this position paper. There are precedents for a Government indemnity, such as that granted by Congress to NASA to permit it to indemnify, as well as provide commercial insurance to, the users of the space shuttle, and any other Government space vehicle (Public Law No. 96-48, October 1, 1979, 42 U.S.C. 2458b). There is also the precedent of the Price-Anderson Act of 1957 (Act of September 2, 1957, Public Law No. 85-256, 71 Stat. 576-77, as amended, 42 U.S.C. 2110 (1970)), which capped the public liability of nuclear reactor licenses and authorized the Government to indemnify up to that cap to the extent private insurance capacity was unavailable. Special insurance pooling arrangements were established to optimize the private insurance capacity. There is also the precedent of the subsequent, and most recent, revisions to Price-Anderson, which maintain a cap on liability but increase the level of private insurance protection through retrospective premium assessments on the commercial licensees.

Whether an indemnity approach, a liability cap approach, or some combination of Government-provided insurance of last resort plus indemnity or cap in excess of the sum of private and Government insurance, is the most appropriate specific protective mechanism against commercially uninsurable risk is, as noted above, not the subject of this position paper. The policy conclusion of this paper is that the commercially uninsurable risks must be contained by some appropriate Government action if the ELV industry is to be viable and competitive.

IX. Key Requirements for Achieving a Solution

Implementation of the risk allocation proposed in this paper would require the following conditions, some of which, it is recognized, may require specific legislative action:

- The commercial space launch services provider obtains, at reasonable cost, liability insurance coverage to the limits of the probable maximum injury and/or damage to third parties and to Government property, in which the Government is a named insured at no cost to it.
- All launch participants accept reciprocal cross-waivers of claims.
- The U.S. Government provides some appropriate form of protection for third-party liability claims in excess of the prescribed limits of liability insurance available at reasonable cost.

- The U.S. Government self-insures its property losses above the prescribed maximum insurance coverage available at reasonable cost.

Adequate commercial insurance capacity to cover the potential probable maximum loss is a key requirement. Such capacity may be achievable through conventional methods of aggregated coverages or through a centrally-managed underwriting facility that might be similar in structure to that previously developed by NASA for the Shuttle program with the insurance industry. Objectives of insurance arrangements would include:

- availability of the maximum insurance capacity at reasonable cost;
- equitable distribution of coverage among those at risk;
- efficient administration of claims; and
- support of U.S. Government officials statutorily responsible for determining the level and quality of insurance coverage of space launch operations.

X. Benefits

Reasonable allocation of launch operation risks through adoption of one of the alternative proposed solutions described above generates several significant benefits:

1. Development of a strong, economically viable and internationally competitive space transportation industry will provide the foundation for the "assured access to space" needed to meet our country's goals in space.
2. Provision of very substantial insurance protection for the U.S. Government, at no cost to it, covering liability for injury and/or damage to third parties and to Government personnel and property up to the "maximum probable" loss, will protect the Government from any losses associated with commercial space launch operations in all foreseeable circumstances.
3. Government assumption or limitation of uninsurable very low probability risks will remove a major road-block endangering full development of the commercial space transportation industry.
4. The attractiveness to American industry in utilizing space for commercial purposes will be enhanced, to the benefit of our international balance of trade, and to the Government, which will be able to purchase launch vehicle services for its own needs at lower unit prices.

The United States, its taxpayers, and the commercial space industry will all mutually benefit from a reasonable and fair allocation of space launch operation risks. The industry will provide substantial benefits directly to

the Government at the industry's expense as a quid pro quo to the Government's acceptance in the public interest of a very low probability of some excess liability at a future date, but at no current cost to the Government.

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Mr. NELSON. The Administration's view seems to be that sufficient commercial insurance will be able to be available when the industry develops in order to cover the risk. Would you agree with that?

Mr. ENGLISH. Well, based upon the input we had from the insurance industry the answer was categorically no. Now I think, Mr. Chairman, you have to remember the distinction between the probable exposure and the possible exposure. For the probable exposure there's a real potential to have the insurance protection. For the possible, or maximum credible incident, the insurance industry felt that the accumulation of risks would exceed the available insurance in the world market.

Mr. NELSON. And what is your answer to the availability of probable insurance? The maximum probable—what's the buzz word?—loss?

Mr. ENGLISH. Yes, maximum probable loss.

Well, Mr. Chairman, that's one of the issues that's still open. We do need to see a risk analysis coming out of the United States Government in terms of, particularly, the property exposure risk that would be associated in the local environment where the launch took place, and we don't have that yet. I understand that is an ongoing activity within the Government. That is an important consideration, to determine an estimated probable level of risk.

Mr. CASSIDY. Mr. Chairman—

Mr. NELSON. Mr. Cassidy?

Mr. CASSIDY. We used in the paper the concept of maximum probable. Whether in fact the specific numbers can be generated with sufficient assurance of accuracy, you know, is to be determined. But within the constraints of the concept, what one has to realize is it's a policy question; and that is, is the Government going to continue in its practice of providing indemnification above available insurance regardless of how it may be derived? Because there is a finite amount of third-party liability, as there is for almost any kind of insurance. And this paper really addresses it from the viewpoint of the policy, and the governmental policy of continuing its practice which, as has been testified earlier, is the standard used throughout the world by other launch activities.

Mr. NELSON. And so where you hear a statement that say—for example, Dr. Cook says that it ought to be left flexible and that you should not adhere to a policy of setting a limit above which the Government will indemnify. You disagree with that policy?

Mr. CASSIDY. I don't think it's necessary to put numbers in legislation. That may be my only major complaint with the legislation.

Mr. NELSON. But, as far as the Government indemnifying above a certain level as defined by maximum probable risk is where you would agree?

Mr. CASSIDY. Yes, sir.

Mr. NELSON. Is that right? You agree with the Government indemnifying above that level?

Mr. CASSIDY. Above whatever is available, right.

Mr. ENGLISH. That's right.

Mr. NELSON. Okay.

Mr. CASSIDY. And whatever can be insured. Because there is a finite limit—

Mr. NELSON. All right. Now—

Mr. CASSIDY [continuing]. That may be and they may change the time.

Mr. NELSON. And let's take one little nuance on that. Whatever above—the Government indemnifying above whatever is available, but then you've got to get in there what is also affordable, in order to be competitive internationally.

Mr. CASSIDY. Exactly. That has to be in the equation, availability and affordability; and, of course, that's the responsibility, one believes at this point, of Department of Transportation to make that assessment.

Mr. ENGLISH. Yes. That was the methodology by which NASA focused on it.

Mr. NELSON. Okay. How would you distinguish commercial launch risk from other high risk commercial activities?

Mr. ENGLISH. That's an excellent question, Mr. Chairman. I think you have to look at—and this is what the AIAA committee attempted to do—to look at the overall circumstances. In terms of the status of this industry, it is an embryonic industry; it is being asked to take over an activity that has been traditionally Government-owned and -operated; it's capital intensive and there is a significant revenue uncertainty, particularly given the buildup of European and other international competition in launch services. You have to look at the totality of risks and requirements of private industry, and the desire on the part of the government, which is highly appropriate, to move away from the single-thread system we had with the Shuttle. When you look at the confluence of these circumstances and facts, the conclusion is that there needs to be a special incentive that might not be necessary for the airline industry, or for any other well-established industry that has a sound economic base with a long history and a sound insurance base with broad-based actuarial experience.

So it is a combination not only of what the risk is but the circumstances in which you are trying to get this industry involved and brought into an effort.

Now maybe that says, Mr. Chairman, that there should be a sunset provision associated with this type of indemnification proposal. That is, it is effective only for a specified number of years, in order to see whether industry forecasts actually materialize.

Mr. NELSON. Thank you. Tell us about your panel's reviewing insurance arrangements among the foreign launch competition.

Mr. ENGLISH. In terms of the foreign competition and what it is doing? We looked at some of the actual contracts that have been entered into between Arianespace and its customers. We talked to the satellite industry; that is, the companies that actually buy those services from foreign launch competitors, and we got their perspective with respect to what they are used to and what they expect to get from the U.S. industry. And our conclusion was that foreign competitors follow the NASA pattern rather closely. The Outer Space Liability Treaty also set certain requirements that prompted foreign competitors to introduce an indemnification scheme into their launch service arrangements. They offer a combination of insurance, up to a certain level, and indemnification above that level.

Mr. NELSON. Tell me about your looking at smaller launch companies which might have smaller vehicles and a smaller payload, and so forth. You look at variations on this whole question of insurance. How does that—is it practical to do that, and can the Government define a flexible standard?

Mr. ENGLISH. Well, we asked the insurance industry specifically about that, and we also asked the Government representatives that we talked to, whether there could be variable premiums associated, for example, with lesser risks; whether there could be variation in terms of the amounts of insurance that would be required and prescribed among launch participants depending on the risk analysis, and it was certainly our clear impression that the Government would establish variable levels of risk insurance requirements. They weren't going to set a standard of X, apply it to a TITAN as well as to a much smaller vehicle. That remains to be seen, of course, because we haven't yet gotten those pronouncements from the Government officially.

Dan, was there anything in the insurance side? I think they felt there could be variations in terms of premiums with respect to different levels of risk.

Mr. CASSIDY. That's why I think it's important that the administrative regulator be involved in this thing so that he can make judgment to meet the needs and not get locked into either—unreasonable circumstances for extended periods, or have to get more legislation in order to recover, or whatever.

I think it has to look more like air traffic control here. The regulator is trying to enhance a flow rate and productivity. And minimizing those things that inhibit the process.

I think to a great extent the foreign governments recognize that the indemnification is such a remote—although potentially catastrophic event, it's so remote that it's very cheap for them just to provide it.

Mr. NELSON. Is the pooling feature of Price-Anderson impractical since we're dealing with so few launches here?

Mr. ENGLISH. In my opinion, it is. I was involved in putting Price-Anderson together, and at the time, Mr. Chairman, the so-called retrospective premium pooling arrangement was not even—well, I won't say it wasn't contemplated because the Insurance Committee at that time did look at that, but at that time there were only a couple of licensees and there didn't appear to be a base that would result in a pool of money that would cover the risks. That was a later development. The '57 Price-Anderson Act, which was the initial Price-Anderson, was a combination of insurance available on the world market and an indemnity scheme. It's not the same as it is today where you now have over a hundred licensees and a retrospective premium insurance scheme pooling.

Mr. CASSIDY. And one point on that, Mr. Chairman. Certain industries have established various pooling arrangements. But even within this industry, you have just a few. We're still talking about what happens when the pool runs out, and that's when we would then have to look at the policy of Government indemnification.

Mr. NELSON. Let me ask you about—if launchers are directed to obtain the maximum insurance, maximum probable to—at reasonable rates to cover the maximum probable risk, who should decide

what is reasonable, the Government or the insurance industry or the launch providers?

Mr. CASSIDY. For the third-party liability? There're two separate issues—

Mr. NELSON. For the third-party.

Mr. CASSIDY [continuing]. The third-party or Government property.

Mr. NELSON. Third-party liability.

Mr. CASSIDY. Third-party, I think the Government should make that determination considering we're asking the Government to also provide indemnification. Now, if that was not the case, as it is in other industries, the industry makes its own determination of what its exposure is and will buy insurance accordingly.

Mr. ENGLISH. But I think the Government—I think the Government has the obligation, Mr. Chairman, to make that determination under the Commercial Space Act and they are proceeding to implement it. Obviously, they have to make that determination in consultation with the insurance industry, and they have to make it in relation to the risk assessment.

Mr. NELSON. Congressman Slaughter? I'm sorry. I didn't see you over there.

Mr. SLAUGHTER. That's all right.

Mr. NELSON. You were blocked by Mr. Clement and—from my line of vision. I'm sorry. I would have turned to you a lot earlier.

Mr. SLAUGHTER. Reference has been made to indemnification being provided by the Government for possible loss. I guess loss that's in excess you might say of a maximum probable loss. But couldn't you accomplish the same thing by having a cap on certain kinds of recoveries, non-economic recoveries? That's getting to be something that's seriously considered in other fields, and why wouldn't that be a sound option for the Government?

Mr. CASSIDY. Mr. Slaughter, the paper does allow such implementation and solutions. What we are recommending here is that the Government does play a role in providing some sort of limitation on the liability of the operators.

Mr. SLAUGHTER. But that would be one limitation that could be used, isn't that correct?

Mr. CASSIDY. Yes, it could.

Mr. ENGLISH. Could be, Mr. Chairman. There is a slight issue under the Duke Power case, in which the Price-Anderson atomic energy liability limitation was challenged and we looked at that case in the subcommittee because, as Mr. Cassidy said, the paper doesn't make a specific recommendation as to a solution, other than the Government should contain the uninsurable risk.

Mr. SLAUGHTER. Which would mean either a limitation or indemnification?

Mr. ENGLISH. Could be. Duke Power, which was a case that went up to the Supreme Court, did indicate that where the Government sets a limit on liability without any indemnity that it may run afoul of the Constitution. It said that Price-Anderson, which was a combination of Government indemnity and a cap, was appropriate. But, if the Government simply set a limit X without any Government protection, the Court implied that it could run into difficulty. But a combination of indemnity and cap is certainly a potential.

Mr. SLAUGHTER. Thank you.

Mr. NELSON. I'd like to invite up Mr. Joel Greenberg, who is president of Princeton Synergetics.

We welcome you and we're looking forward to your statement. Your entire statement will be made a part of the official record and, if you could summarize your comments for us, we would be most pleased.

**STATEMENT OF JOEL S. GREENBERG, PRESIDENT, PRINCETON
SYNERGETICS, INC., PRINCETON, NJ**

Mr. GREENBERG. Thank you.

Incidentally, I'm also a member of the AIAA.

Mr. NELSON. Good. See if you can flip that switch there. There you go.

Mr. GREENBERG. I'm also a member of the AIAA and, needless to say, not all of the members are tuned in with the paper, the position paper of the AIAA, in particular since the issues go much beyond the straight insurance or legal implications, I believe.

But at any rate, Mr. Chairman, and members of the House Committee on Science, Space and Technology, I appreciate the opportunity to meet with you today. I'm going to summarize my written statement and will limit my comments to the third-party liability issues.

Since 1961, I've been involved in numerous studies of space, space transportation systems and the commercial development of space. In recent years, I have been responsible for studies pertaining to launch insurance and third-party liability insurance for space launches. These studies have been performed for both NASA and the Department of Transportation. However, the views expressed and the conclusions reached in the following discussion are the sole responsibility of the speaker.

A number of firms have announced their intended entry into the commercial expendable launch vehicle market. They have expressed concern with the potential unlimited third-party liability that could result from an accident and the competitive advantage gained by Ariane, Proton, and other launch vehicles. As a result, the U.S. ELV firms have appealed to the U.S. Government to provide indemnification against claims above commercially available insurance and/or place a legislative cap or limit on maximum liability. H.R. 3765 responds, amongst other things, to this appeal. The AIAA, perhaps not unnaturally, has sided with the ELV industry in calling for indemnification and/or a legislative cap on liability.

The following discussion is presented to (a) bring out facts possibly not previously considered and (b) to broaden the current debate on third-party liability insurance so as to include consideration of the basic underlying cause of the liability insurance problem and likely future problems that might arise if the cause is not directly addressed. The underlying cause of the problem is the difference that currently exists in the ELV/Government/industry infrastructure employed by nations competing for ELV business.

The launching of any payload into space involves certain risks. These risks include the loss of the launch vehicle and/or payload,

and the loss and damage to property and injury to people. A major problem facing the commercial launch industry that is associated with each launch is a very small probability of an accident that may result in catastrophic third-party damage and resulting claims and awards. What is the maximum third-party damage and resulting claims that may result from a launch accident is like asking how high is the sky. Because every time a launch takes place it is possible, although with very little likelihood, that third-party claims may result and that these claims and resulting awards could exceed the resources of the commercial launch firms. Therefore, the commercial launch industry has turned to insurance for protection. However, no assurance has been forthcoming from the space insurance industry that insurance will be available when needed at reasonable rates.

In the case of the Space Shuttle payloads the problem of how high the sky is was solved by NASA indemnifying for claims in excess of the \$500 million required insurance. Foreign launch competitors have in their launch service arrangements with their customers followed the NASA indemnification precedent. The risk of third-party liability beyond available levels of insurance is assured by these competitors through a combination of customer-provided or paid for insurance, in some cases with guaranteed availability and cost, coupled with indemnification in excess of the available insurance coverage. In addition, the governments of the European Community have agreed to indemnify Arianespace against claims in excess of this amount. Thus, U.S. commercial launch firms do not know how high the sky is, whereas Ariane does.

The desire of the commercial ELV firms to have a limit placed on their third-party liability is understandable. However, the determination of the need for indemnification and/or a legislative cap for the third-party liability claims should consider many factors including the following.

NASA has indemnified Space Shuttle commercial payloads against claims in excess of commercially available third-party insurance on the order of \$500 million. It may, however, be argued that since the Government owns the Space Shuttle, and all Space Shuttle flights involve Government payloads and/or experiments in addition to commercial payloads, the Government should participate in the liability risk. Commercial ELV launches involve commercial launch vehicles and may involve only commercial payloads. Thus there is a significant difference and the indemnification precedent argument is not totally applicable.

The Price-Anderson Act has also been discussed as a precedent for indemnification and a legislative cap for third-party claims that might result from U.S. ELV launches. At the start of the nuclear power industry, in 1957, little experience existed with the provision of nuclear power and there certainly was little or no experience with respect to the accidents and claim statistics. Something was indeed necessary to allay the fears of the power industry if a nuclear power industry was to develop. Commercial ELV's are somewhat different—there have been in excess of 10,000 space launches prior to U.S. ELV commercialization. Also, the U.S. ELV firms have stated publicly that in the absence of Government indemnification and/or a legislative cap on third-party claims they would still

intend to offer commercial launch services. In addition, damage from nuclear accidents was excluded from the coverage of home insurance policies, whereas no exclusion currently exists for damage caused by space launches.

Every individual as well as business entity faces risk of causing damage to third-parties. Auto drivers, homeowners, small businesses and large businesses face liability risk and purchase liability insurance to the maximum amount that is deemed affordable. Perhaps they aim to cover the probable maximum event. All parties face the same question concerning the finite amount of insurance and claims that might occur against them: How high is the sky? Nearly all human endeavors, private and corporate, are undertaken without having an answer to this question. For example, the airlines may have a higher likelihood of accidents comparable in magnitude to ELV's with 747's operating continuously in areas of high population density, and they don't have any launch controllers to blow up an errant vehicle. The airlines have finite liability insurance and do not have an answer to how high is the sky. Life and business go on without knowing how high the sky is. An argument may be cited that the ELV firms are different because they are needed for national security reasons. If this is indeed the case, then why focus on any other argument? This is in itself sufficient justification for indemnification or a legislative cap.

U.S. commercial ELV firms have stated that they are at a significant competitive disadvantage because of foreign governments' involvement in third-party liability insurance. ELV firms market a service comprised of multiple attributes that include insurance cover, reliability, price, availability and schedule. When considering competitiveness all attributes should be considered, not just insurance. U.S. commercial ELV firms can remain competitive on the insurance issue if they offer the same insurance package as Arianespace. But in the absence of Government indemnification they will have to bear somewhat more risk than Arianespace.

With respect to the price attribute, how has the recent softening of the dollar affected relative pricing? In order to remain competitive in the short-term, is it really necessary for the U.S. Government to provide for indemnification? If the answer to this last question is no, then the insurance issue is a non-issue. If the answer is yes, then the issue centers on where Government indemnification of third-party liability may be leading.

Assume that Government indemnification and/or a legislative cap is the chosen course of action undertaken in order to ensure the competitiveness of the U.S. ELV's. What happens when the ELV firms become noncompetitive in the other attributes; for example, price? Play out a scenario. In the short term all ELV firms will prosper because demand far exceeds supply. In the long term, perhaps 5 years, supply exceeds demand. Under this condition it is likely that foreign competition, because of the deep pockets provided by foreign government involvement, will follow price reduction policies to maintain or increase their market share. U.S. firms will then be at a disadvantage: they will be noncompetitive with respect to the price attribute. Will they then at this point again approach the U.S. Government citing prior Government involvement and in-

demnification as a precedent, ask for Government subsidization so that they may remain price competitive?

The point is that a basic problem exists. The U.S. commercial firms are trying to compete with foreign firms that have an involvement of their governments. This is not a stable situation and it's the underlying cause of the competitive problem. Rather than try to address the effect, it would be wise at this time early in the ELV commercialization process to directly confront the cause—the differences in the government/industry structures of nations competing for the ELV launch and payload market. U.S. commercial ELV firms will be under considerable financial pressure if they are to compete with foreign sponsored firms. This is likely to result in an unstable situation and begs for the continuing involvement of the U.S. Government.

The conclusions that I come to are as follows, and are based on the general premise that in the short term demand for space launches will exceed supply but in the long term supply may tend to exceed demand.

1. For the short term, there is no need for the U.S. Government to provide indemnification or a legislative cap on third-party liability insurance for space launches. This has little or no bearing on the competitiveness of the U.S. ELV industry.

2. The lack of Government indemnification or a legislative cap will affect the risk associated with commercial ELV business ventures. This risk is similar to that faced by and accepted by many other important business sectors in the U.S. economy.

3. In the long-term it is likely that foreign ELV's will establish pricing and other policies, with support of their governments, that will cause U.S. commercial ELV's to become noncompetitive. This will necessitate the need for U.S. Government involvement in the form of subsidization or a change in the private-public sector infrastructure for the provision of commercial ELV launch services.

4. The U.S. Government should continue to try to negotiate fair trade agreements with other nations possessing space launch capabilities. As part of this negotiation process it may be desirable to demonstrate U.S. resolve to maintain a commercial U.S. ELV industry. This demonstration might take the form of carefully worded legislation, possibly including third-party liability indemnification, to clearly indicate the U.S. intent to provide subsidization as and when deemed necessary to maintain a commercial ELV industry.

And lastly, but not leastly, the U.S. Government should concentrate on setting minimum insurance requirements and/or financial responsibility so as to ensure payment to third parties suffering injury in the case of a launch accident. The U.S. Government has a responsibility to ensure compensation to the damaged parties.

I thank you.

[The prepared statement of Mr. Greenberg follows:]



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February 16, 1988

STATEMENT OF

MR. JOEL S. GREENBERG
PRESIDENT

before the

SUBCOMMITTEE ON SPACE, SCIENCE AND APPLICATIONS

of the

COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

Mr. Chairman, Members of the House Committee on Science, Space and Technology, I appreciate the opportunity to meet with you today and to share with you my views and concerns regarding H.R. 3765, "Commercial Space Launch Act Amendments of 1987". Since 1961 I have been involved in numerous studies of space transportation systems and the commercial development of space. [1-12] In recent years I have been responsible for numerous studies pertaining to launch insurance and third-party liability insurance for space launches. These studies have been performed for both NASA and DoT. [13-17] However, the views expressed and the conclusions reached in the following discussion are the sole responsibility of the author.

Introduction

Martin Marietta, McDonnell-Douglas, General Dynamics, American Rocket Co., and Space Services, Inc. have announced their intended entry into the commercial expendable launch vehicle (ELV) market. They have expressed concern with the potential "unlimited" third-party liability that could result from an accident and the competitive advantage gained by Ariane, Proton and other launch vehicles through government indemnification of claims in excess of a limited amount of customer-provided or paid-for insurance. As a result the U.S. ELV firms have appealed to the U.S. Government to provide indemnification against claims above commercially available insurance and/or place a legislative "cap", or limit, on maximum liability. HR3765 currently being debated by the U.S. House of Representatives responds, amongst other things, to this appeal. The Space Shuttle \$500 million

indemnification level and the Price-Anderson Act (relating to the Nuclear Power Industry) have frequently been cited as precedents in their appeals.

The debate now rages with respect to what action, if any, the U.S. Government should take to encourage the entry of U.S. firms into the commercial ELV market. While the ELV firms appeal for assistance to relieve high risk levels and "unfair" competitive advantages they have publicly stated (at the October 1987 International Astronautical Federation Congress, Brighton, England) that, in the absence of indemnification and/or a legislative cap, they would still enter the commercial ELV market. The American Institute of Aeronautics and Astronautics (AIAA) has prepared a Position Paper entitled "U.S. Commercial Space Transportation Risk Allocation and Insurance". [18] The AIAA, perhaps not unnaturally, has sided with the ELV industry in calling for indemnification and/or a legislative cap on liability.

The following discussion is presented (a) to bring out facts possibly not previously considered and (b) to broaden the current debate on third-party liability insurance so as to include consideration of the basic underlying cause of the liability insurance problem and likely future problems that might arise if the cause is not directly addressed. The underlying cause of the problem is the difference that currently exists in the ELV government/industry infrastructure employed by nations competing for ELV business.

Background

The launching of any commercial or government payload into space involves certain risks. These risks include the loss of the launch vehicle and/or payload and loss and damage to property and injury to people. In addition, there are prelaunch and post launch risks. [19]

The space insurance industry currently makes available a number of insurance products for the space industry. These products cover many aspects of space launches and space operations. Space insurance falls into three main categories: liability cover, launch cover and in-orbit operations cover. Different types of insurance are applicable during different periods of time. The risk period has historically been broken into the time preceeding launch operations (i.e., prelaunch), the time period during launch operations, and the time period during in-orbit operations. Prelaunch insurance is concerned primarily with product liability, damage in transit, and other more or less conventional forms of insurance.

Launch period insurance includes both launch and liability cover. Launch insurance covers the performance of the launch vehicle, transfer stage, apogee kick motor, and, until recently, the deployment and initial operation of the satellite. The magnitude of claims for damage covered by launch insurance can be well

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defined and controlled. Liability insurance includes cover for the two classes of liability which may arise from a launch accident; "first and second-party" liability, and "third-party" liability. The former is liability for injury or damage to employees and property of the Government and/or the commercial space transportation provider resulting from the launch process. The latter, currently the area of major concern to the commercial launch industry, is legal liability to those individuals, corporations or other entities that had no involvement in the launch. The potential magnitude of third-party damage and resulting claims is not known and thus potentially exposes the ELV industry to unbounded claims.

In-orbit insurance is applicable during the in-orbit operations time period and covers loss of fuel, power or transponders. Satellite owners are indemnified for loss of revenue because of a malfunctioning satellite or for the cost to replace with a new satellite.

Liability insurance is also provided for the in-orbit operations time period. This insurance covers damage to other satellites resulting from collisions in-orbit and damage to third-parties resulting from satellite return to the Earth.

A major problem facing the commercial launch industry is that associated with each launch is a small probability of an accident that may result in catastrophic third-party damage and resulting claims and awards. [20] To date no third-party claims have been filed for damage resulting from space launches, and it is estimated that to date there have been in excess of 10,000 space launches. What is the maximum third-party damage and resulting claims that may result from a launch accident is like asking how high is the sky. Thus every time a launch takes place it is possible, although with little likelihood, that third-party claims may result and that these claims and resulting awards could exceed the resources of the commercial launch firms. Therefore the commercial launch industry has turned to insurance for protection. However no assurance has been forthcoming from the space insurance industry that insurance will be available, when needed, at reasonable rates. Since it is not possible to describe the worst possible accident, it is possible that claims and resulting awards could exceed the maximum amount of insurance coverage available on the world market to the commercial launcher at reasonable cost.

The historical financial performance of the space insurance industry has not been good. [19] As a result the cost of insurance has risen dramatically in recent years and the availability of insurance has been reduced. Launch insurance cost has increased from 10 to more than 25 percent of launch and payload cost and third-party liability premiums have risen from \$100,000 to in excess of \$500,000 (according to industry spokesmen) for \$500 million cover. The space insurance industry will not make

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long term availability and price commitments to the U.S. ELV industry. Even if the insurance industry were to make commitments of \$500 million or more per launch (\$500 million was available for individual payloads flying on the Shuttle), the ELV firms would still be liable for claims above the insured amount — again, how high is the sky? In the case of the Space Shuttle payloads the problem of how high the sky is was solved by NASA indemnifying for claims in excess of the \$500 million required insurance.

A similar problem was encountered earlier by the U.S. civilian nuclear power industry. This was solved by the enactment of the Price-Anderson Act in 1957. This Act was aimed at overcoming industry reluctance to participate in nuclear power generation due to the fear of catastrophic, uninsured claims from a nuclear accident and to avoid delay or failure to provide compensation to the public in the event of an accident. The Act requires a nuclear power operator to submit proof of financial protection (either through private insurance, private contractual indemnities, self-insurance, or other financial responsibility) to cover liability claims for damages caused by nuclear materials. Under the Act the Government agreed to be liable for \$500 million and limited each nuclear facility's maximum liability to \$560 million (the cap), the amount then available from the private insurance market (\$60 million) plus the \$500 million the Government would indemnify in case of loss exceeding private sector capacity. A fee was imposed on reactor operators for the extra protection from the Government.

A 1975 amendment to the Price-Anderson Act required that a secondary level of financial protection be created through payments of retrospective premiums (\$5 million per large operating reactor) when and if a nuclear catastrophe occurred at one of the plants that exhausted the primary level of financial protection (that available privately). The intention was to phase out Government indemnification and this has actually been the effect of the secondary level. The amount of insurance available from the private insurance market (which grew to \$160 million by 1979) together with the amount that is available in the secondary layer now exceeds \$560 million. [21,22]

Foreign launch competitors have in their launch services arrangements with their customers followed the NASA indemnification precedent. The risk of third-party liability beyond available levels of insurance is assured by these competitors through a combination of customer-provided or paid-for insurance, in some cases with guaranteed availability and cost, coupled with indemnification in excess of the available insurance coverage. Ariane customers, for example, are provided with third-party liability insurance coverage in an amount of approximately 420 million French francs (according to a 1985 launch agreement). Reinsurers provide this coverage. In addition, the Governments of the European community have agreed to indemnify Arianespace against

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claims in excess of this amount. Thus, U.S commercial launch firms do not know how high the sky is whereas Arianespace does!

Discussion

The desire of the commercial ELV firms to have a limit placed on their third-party liability is understandable. A recently completed AIAA position paper [18] has concluded that "To foster and encourage a U.S. commercial space transportation industry that can be effectively competitive with European and other non-U.S. launch service providers, it is necessary to develop a commercially-tolerable approach to the allocation of these launch operations liability risks. The solution recommended in this paper would allocate these liability risks on the basis of those that are commercially insurable at reasonable premiums, as determined by Governmental authority, and those that are in excess of such insurance capacity. The level of reasonably-available commercial insurance would be prescribed by the Government taking into account applicable risk factors, would be paid for by the commercial sector with the Government as a cost-free named beneficiary. The excess-of-insurance liability risks would be assumed or contained by the U.S. Government, either through indemnity, a cap on liability or, possibly, some combination of Government-provided insurance of last resort and indemnity or cap of liability in excess of the insured risk." [18] Thus the AIAA is asking for indemnification and/or a legislative cap.

The determination of the need for indemnification and/or a legislative cap for the third-party liability claims should consider many factors including the following.

NASA has, as mentioned previously, indemnified Space Shuttle commercial payloads against claims in excess of commercially available third-party insurance (\$500 million). This NASA indemnification of Shuttle users for claims in excess of \$500 million has often been cited as precedent for Government indemnification for commercial ELV launches. It may however be argued that since the Government owns the Space Shuttle and all Space Shuttle flights involve Government payloads and/or experiments in addition to commercial payloads, the Government should participate in the liability risk. Commercial ELV launches involve commercial launch vehicles and may involve only commercial payloads — thus there is a significant difference and the indemnification precedent argument is not totally applicable.

The Price-Anderson Act has also been discussed as a precedent for indemnification and a legislative cap for third-party claims that might result from U.S. ELV launches. [18] At the start of the Nuclear Power Industry (1957) little experience existed with the provision of nuclear power and there certainly was little or no experience with respect to accidents and claim statistics. Something was indeed necessary to allay the fears of the power industry if a nuclear power industry was to develop. Commercial

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ELV's are somewhat different — there have been in excess of 10,000 space launches prior to U.S. ELV commercialization. Also the U.S. ELV firms have stated publicly [23] that in the absence of Government indemnification and/or a legislative cap on third-party claims they would still intend to offer commercial launch services. In addition, damage from nuclear accidents was excluded from the coverage of home insurance policies whereas no such exclusion exists for damage caused by space launches.

Every individual as well as business entity faces risk of causing damage to third-parties. Auto drivers, homeowners, small businesses and large businesses face liability risk and purchase liability insurance to the maximum amount that is deemed affordable. All parties face the same question concerning the finite amount of insurance and claims that might occur against them — how high is the sky? Nearly all human endeavors, private and corporate, are undertaken without having an answer to this question. Occasionally, individuals and firms are forced into bankruptcy because liability awards exceed insurance and other assets. In the absence of government indemnification and/or a legislative cap on third-party liability claims, this indeed may happen to an ELV firm or any other firm in the U.S. For example, the airlines may have a higher likelihood of accidents comparable in magnitude to ELVs with 747's operating continuously in areas of high population density. The airlines have finite liability insurance and do not have an answer to "how high is the sky?". Life and business go on without knowing how high the sky is. An argument may be cited that the ELV firms are different because they are needed for national security reasons (AMROC? SSI?). If this is indeed the case then why focus on any other argument — this in itself is sufficient justification for indemnification and/or a legislative cap.

The U.S. commercial ELV firms have stated that they are at a significant competitive disadvantage because of foreign governments' involvement in third-party liability insurance.. ELV firms market a service comprised of multiple attributes that include insurance cover, reliability, price, availability and schedule. When considering competitiveness all attributes should be considered, not just insurance. U.S. commercial ELV firms can remain competitive on the insurance issue if they offer the same insurance package as Arianespace. But in the absence of Government indemnification and/or cap they will have to bear somewhat more risk than Arianespace. It appears that Martin Marietta has decided to bear the risk since Martin Marietta has agreed to launch 15 communications satellites for the General Electric Company's Astro-Space Division. [24] It is unlikely that Martin will turn away this business if Government indemnification is not forthcoming.

With respect to the price attribute, how has the recent softening of the dollar effected relative pricing? In order to remain competitive in the short-term is it really necessary for the U.S.

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Government to provide for indemnification and/or a legislative cap on third-party liability? If the answer to this last question is no then the insurance issue is a non-issue. If the answer is yes then the issue centers on where Government indemnification of third-party liability may be leading!

Assume that Government indemnification and/or a legislative cap is the chosen course of action undertaken in order to ensure the competitiveness of U.S. ELVs. What happens when the ELV firms become non-competitive in the other attributes -- for example price? Play out a scenario -- in the short-term all ELV firms will prosper because demand far exceeds supply. In the long-term (perhaps 5 years) supply exceeds demand. Under this condition it is likely that foreign competition, because of the deep pockets provided by foreign government involvement, will follow price reduction policies to maintain or increase market share. U.S. firms will then be at a disadvantage -- they will be non-competitive with respect to the price attribute. Will they then at this point again approach the U.S. Government citing prior Government involvement in indemnification as a precedent, ask for Government subsidization so that they may remain price competitive? The point is that a basic problem exists: U.S. commercial firms are trying to compete with foreign firms that have an involvement of their governments. This is not a stable situation and is the underlying cause of the competitive problem. Rather than try to address the effect it would be wise at this time early in the ELV commercialization process to directly confront the cause -- the differences in the government/industry structures of nations competing for the ELV launch and payload market.

Conclusions

It seems that the logical consideration of the third-party liability insurance issue leads to the conclusion that this may be but the tip of an iceberg -- the iceberg being the form or structure of the U.S. ELV firms in combination with Government involvement. Since the foreign ELV industry is a source of significant national pride and, through the sale of launch services and (with increasing likelihood) related payloads, can significantly effect the balance of payments and the development of high technology, it is likely that foreign governments will continue to play a significant role in the ELV scene. U.S. commercial ELV firms will be under considerable financial pressure if they are to compete with foreign sponsored firms. This is likely to result in an unstable situation and begs for the continuing involvement of the U.S. Government.

The above considerations lead to a number of options worthy of further deliberations, namely (1) negotiate fair trade agreements with foreign entrants into the ELV market thereby eliminating the competitive advantage that might be gained through government subsidization, (2) provide government assistance as and when

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needed to maintain a competitive U.S. ELV industry, (3) alter the current U.S. government/industry infrastructure associated with the U.S. commercial ELV industry so as to include direct U.S. Government participation, and (4) allow the U.S. commercial ELV industry to maintain a strictly private posture without the direct involvement of the U.S. Government.

Each of these alternatives has obvious problems. In the first case (i.e., fair trade agreements), there is a basic question as to what constitutes a subsidy and what is to be done if other nations do not choose to play by the rules (whose rules?). In the second case (i.e., Government assistance) there is the problem of what future assistance will be required. It may well be that if fair trade agreements cannot be negotiated the U.S. Government will be forced, in one way or another to subsidize (through indemnification, insurance cap, price, R&D, etc.) the U.S. commercial ELV industry if indeed there is to be a U.S. commercial ELV industry.

In the third case (i.e., altering the current infrastructure) there is the problem of having increased Government involvement in commercial endeavors at a point in time when the Government is trying to reduce its involvement. Finally, in the fourth case (i.e., strictly private posture) there is the problem of what to do if the commercial ELV firms prove, in the long-term, to be non-competitive with the foreign ELV organizations (with or without their government's involvement).

The conclusions that I come to are as follows and are based on the general premise that in the short-term, demand for space launches will exceed supply but in the long-term supply may tend to exceed demand.

- For the short-term, there is no need for the U.S. Government to provide indemnification or a legislative cap on third-party liability insurance for space launches. This has little or no bearing on the competitiveness of the U.S. ELV industry.
- The lack of government indemnification or a legislative cap will effect the risk associated with commercial ELV business ventures. This risk is similar to that faced by and accepted by many other important business sectors in the U.S. economy.
- In the long-term it is likely that foreign ELVs will establish pricing and other policies (with the support of their governments) that will cause U.S. commercial ELVs to become non-competitive. This will necessitate the need for U.S. Government involvement in the form of subsidization or a change in the private - public sector infrastructure for the provision of "commercial" ELV launch services.

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- The U.S. Government should continue to try to negotiate fair-trade agreements with other nations possessing space launch capabilities. As part of this negotiation process it may be desirable to demonstrate U.S. resolve to maintain a commercial U.S. ELV industry. This demonstration might take the form of carefully worded legislation, possibly including third-party liability indemnification, to clearly indicate the U.S. intent to provide subsidization as and when deemed necessary to maintain a commercial ELV industry.
- The U.S. Government should concentrate on setting minimum insurance requirements and/or financial responsibility so as to ensure payment to third-parties suffering injury in the case of a launch accident. The U.S. Government has a responsibility to ensure compensation to damaged parties.

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JOEL S. GREENBERG

Joel S. Greenberg has more than thirty years of experience in systems analysis, operations research, long-range planning, business planning and evaluation, and policy analysis. He is the President of Princeton Synergetics, Inc., a policy research and consulting firm located in Princeton, New Jersey. He formerly was a Vice President of ECON, Inc., a member of the Aerospace Department of Princeton University and a member of RCA's Corporate Staff where he planned and evaluated new business ventures for the Corporation. Prior to this he was responsible for the planning and analysis of several major weapon systems for the Air Force.

Mr. Greenberg was a frequent guest lecturer for the American Management Associations lecturing on the subjects of new business planning, financial analysis, risk analysis and market forecasting. He has testified before Congress concerning the commercialization of the civil land remote sensing system, was recently elected to the International Academy of Astronautics, and is Co-Chairman of the Academy's Scientific Committee on Economics of Space Operations. He is also a member of the AIAA, serves on the AIAA's International Activities Committee, and was the founder and Chairman of the AIAA's Economics Committee.

Mr. Greenberg has been responsible for a broad range of studies relating to space transportation, space insurance and commercialization of space. He has been a major contributor to the field of economic and risk analysis of space systems and operations and has published extensively.

Most recently he has participated in the development of launch and on-orbit operations models for the Air Force, NASA and the SDIO; analyzed precedents for government provision of third-party liability insurance for ELVs for DoT; analyzed the effect of launch insurance on communications satellite business ventures; performed comparisons of launch vehicles for communications satellite missions; and is currently performing policy and planning studies for NASA's Office of Commercial Programs.

Mr. Greenberg holds an M.E.E. degree from Syracuse University, a B.E.E. degree from the Polytechnic Institute of Brooklyn and has performed graduate studies in operations research at the University of Pennsylvania.

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Mr. NELSON. Thank you, Mr. Greenberg. We're delighted to have you here from the State of New Jersey.

Mr. English, would you like to respond to any of Mr. Greenberg's comments?

Mr. ENGLISH. Ten words or less, Mr. Chairman?

Mr. NELSON. Whatever is your preference.

Mr. ENGLISH. I think that, of course, Mr. Greenberg represents a point of view. It is not the point of view of the AIAA, in terms of its position paper, which I might point out passed the test of a 40-member Policy Committee of the AIAA before being referred by that Policy Committee to the Board of Directors for its review and consideration. The report does represent an official position paper of the AIAA, approved by the Board of Governors, even though I am sure every member doesn't necessarily agree with it, but I don't think that's the point.

The position of Mr. Greenberg is I think certainly a point of view. It's what I'll call a laissez-faire approach. It's highly dependent on the industry taking the risk of uninsurable levels of liability, and I think one can make no mistake that the potential risks, when you look at the accumulation of insurable risks in a launch process, can exceed available insurance. That is the position of the insurance industry and I don't think it can really be challenged.

So the question is will the industry proceed ahead if the Government does not take steps to contain the uninsurable risk? The AIAA's position is the Government should not run the risk that the industry may not proceed or stay in for the long pull and that we'll go back to a single-thread system. Its position is don't take that risk. Mr. Greenberg may be right, but I don't think it will be determinable in the near term.

Mr. NELSON. Mr. Greenberg, as I understand it, your company did a report back in 1985, entitled "Federal Government Provision of Third-Party Liability Insurance to Space Vehicle Users."

Mr. GREENBERG. That is correct.

Mr. NELSON. Is that correct? What did it recommend as to an appropriate Federal role?

Mr. GREENBERG. Well, that report indicated that at that point in time third-party liability insurance, which was being offered for approximately \$100,000 for a \$500 million policy, was priced way out of line, and the insurance industry really made a gross mistake as to the pricing policies. We concluded that those prices were out of line by a factor of 5 to 10 times with other comparable kinds of risks, namely, the nuclear power industry, the aircraft and maritime industries, and so forth.

Subsequent to that the rates rose quite rapidly, by a factor of 3 to 5 times, and now they are basically not being quoted anymore. We did not conclude a desirable course of action for the Government. We suggested some various alternatives and I don't recall exactly what all the alternatives were that we suggested.

Mr. NELSON. Were any of the alternatives where there would be a Federal Government sharing arrangement?

Mr. GREENBERG. I believe some of the alternatives we suggested included that; yes.

Mr. NELSON. Would any of those alternatives apply to this situation?

Mr. GREENBERG. Well, again, the situation is such that I do not believe that third-party liability insurance per se is necessary at this point. At the International Astronautical Federation Congress in Brighton in October there was a session where all of the ELV companies were represented; either their vice presidents or presidents or chairman of the board were included in the panel. They all spoke their piece for a number of minutes. I stood up and asked the question in front of about 500 people in the audience. The question was: In the absence of Government indemnification and/or a legislative cap would you still launch commercial ELV's?

Mr. Brackeen, from Martin-Marietta, jumped up, took the microphone and stated publicly—Yes, the Board of Directors has already made that decision—and the other ELV firms agreed with him.

Mr. NELSON. All right. We're going to, we'll have an opportunity—Mr. Brackeen will be here tomorrow and we'll ask him that question.

Now I want you to understand that the framework in which this whole thing is coming up is the question of international competition and international launchers. Do you have a position as to taking American-made satellites and launching them on foreign launchers?

Mr. GREENBERG. I don't think that should occur and, in fact, that's why I go much beyond the considerations of the third-party liability insurance. Because it's my opinion that the U.S. ELV firms, if they are allowed to continue as privately owned organizations without any form of Government support, are going to head for a very, very rough road ahead of us because they are competing in the international marketplace with firms which have their government's financial support and I don't think that's a stable situation. I think in the long term the U.S. has to face up to the fact that it may be called upon, if it does want to have a commercial U.S. ELV industry that it's going to have to do an awful lot more than just third-party liability insurance.

I'm not against third-party liability insurance per se. I don't think it's necessary at this time. But I do think that it's the tip of the iceberg. The iceberg being the difference between the structures of industry and government in the competitive ELV countries. I think that's where the problem is and that's where we're heading. And we should lay the groundwork now in anticipation of where the problems may come.

Mr. NELSON. I want to make sure that the record clearly—that I understand your approach here. You said that, and I think you accurately described the situation, that other nations, including the Chinese, the Soviets, have the essence of the government subsidy in one way or another—

Mr. GREENBERG. Yes, sir.

Mr. NELSON [continuing]. Including the third-party liability question.

Now what are you saying, then, with regard to the American ELV? That they should or should not have that kind of indemnification on third-party liability?

Mr. GREENBERG. The U.S. ELV industry must be competitive with foreign ELV's.

Mr. NELSON. Right.

Mr. GREENBERG. Now I'm not quite sure what competitive means today. As far as I'm concerned, the ELV firms can be competitive today. They certainly are competitive with the weak U.S. dollar at this point in time as far as I can tell. Only nobody will discuss that. It's not a matter of being competitive in insurance, it's not a matter of being competitive in price, it's not a matter of being competitive on availability—it's the total package that is being offered. When one sells a refrigerator one doesn't say, I'm competitive because I have a white refrigerator. It's the total package.

Mr. NELSON. That's correct. And we're trying to dissect this package, and one element of the package that we're looking at is this question of, Lord forbid, if a rocket went out of control and a range safety didn't control it sufficiently and there was some liability. And what the manufacturers are articulating is that that's a part of the competitive package. That if they had to buy insurance to that level to cover that liability that it would be too expensive and they couldn't be competitive.

Mr. GREENBERG. Well, I'm in——

Mr. NELSON. And your response to that is what?

Mr. GREENBERG. Yes. I'm in business also and I have third-party liability insurance. My third-party liability insurance does not cover the maximum possible event; it covers a maximum probable event. And we all face that, when we buy insurance for our automobiles, liability insurance, or any other business. I don't know how the chemical industry could afford to cover a probable maximum event. It's not possible to cover unknown kinds of events.

The launch vehicle industry has a history. They have over 10,000 launches behind them—in fact, it might be closer to 15,000 launches. There has never been a third-party liability claim filed. So the risk is relatively small.

Now it's true that the risk can be quite large. How large? The sky is the limit. No matter how much insurance you have that amount of insurance might always be exceeded, and I think that's what everybody is worried about. But on the other hand, we all go about our normal lives facing untold liabilities.

Mr. NELSON. Well, I thank you, gentlemen. It has been an enlightening discussion. We have had a good hearing today, a very good hearing. And it's my hope, in the course of the hearing tomorrow that it will start to round out this subject as we get ready to put the final touches and massaging on this piece of legislation as we start to move it forward. Thank you. Have a good day.

The meeting is adjourned.

[Whereupon, at 4:15 p.m., the subcommittee was adjourned, to reconvene subject to the call of the Chair.]



H.R. 3765, COMMERCIAL SPACE LAUNCH ACT AMENDMENTS

WEDNESDAY, FEBRUARY 17, 1988

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS,
Washington, DC.

The subcommittee met, pursuant to call, at 9:45 a.m., in Room 2318, Rayburn House Office Building, Hon. Bill Nelson (chairman of the subcommittee) presiding.

Mr. NELSON. Good morning. The committee will come to order.

We had a good hearing yesterday. I must say that what started off in testimony among three branches or three different agencies of the administration in different directions, different commentary, ended up toward the end of the hearing—on this legislation that we're going to consider, that we filed—ended up being a lot closer to the essence of the legislation.

A lot of the commentary that was given throughout the course of the hearing, upon further examination and closer examination, it became apparent that there was some misinformation, there was lack of communication, there was lack of communication from one agency to another, there was lack of communication about what actually the bill said and what it didn't say, and a lot of those things that they were saying were really in synch with the legislation that we filed. What we filed is an attempt to do something for this country to allow, when we want to put a satellite on orbit, that it can go on an American launcher.

Now, I must admit that when people have—I have heard responsible organizations say to me, and say to the world, and say to the press, that they want to ship United States satellites to be launched on the Soviet Proton, that's like waving a red flag in front of me. If there are international and foreign policy reasons to do that, that's one thing; but just as a matter of course of business, that is another thing. That's not looking out after our own interests, not in some jingoistic and parochial way. It's a looking out for the preservation protection of our technology and the lead, the precious lead that we have in this area of the space program. There are other parts that the Soviet Union is ahead of us in. Well, we're down, we're being kicked, and it's time for us to pull ourselves up, get back on that horse and ride him.

The subject of this hearing today is all a part of that. It's all a part of us trying to do what is in the best interest of this country and for our people.

Now, the strength of this country is that we are a great, diverse land, with a lot of different ideas, and in the attempt at expression of these different ideas that somewhere we will build consensus, and that's my job, to get it all out here on the table in a full, fair, and frank discussion, and then make a decision and move.

We start with a vehicle. This vehicle, by no means, is the end product. It's a filed bill, filed on December 15. We, in fact, did scrub it quite a bit. We circulated it. We changed it quite a bit. We had a good bit of input that was most productive, very enlightening, and we filed it, and about 22 Members of Congress have joined.

Now, it's interesting—this just really hasn't happened before. But there is a letter that is being circulated by a blue ribbon group of American enterprises that says, basically, we appreciate the thrust of H.R. 3765—and I'm going to quote from it. "Legislation will greatly assist industry's ability to establish a viable and competitive U.S. commercial space transportation capability."

This letter is signed by 14 launch and satellite manufacturers and users, and insurance brokers and underwriters. So it's everything from Alexander and Alexander, Contel, Ford Aerospace, G.E. Communications, General Dynamics, GTE Spacenet, Hughes, International Technology Underwriters, LTV Missiles and Electronics, Marsh & McLennan, Martin Marietta, McDonnell Douglas, the National Association of Insurance Brokers, Satellite Broadcasting and Communications Association. So I think that sort of tells the story.

Let me tell you there is no pride of authorship in this piece of legislation. It is a starting point.

Now, there is one thing that's a little different. As you know, the legislative wheels grind very slowly, and it would be easy for us to take a tact and say well, we'll just wait a year and we'll deal with the new administration, whoever they may be, and we'll get this thing moving. But that's a year that's wasted, and that's a year that's valuable. And so that's why we're going to mark up this legislation, and we're going to try to build consensus, and we're going to try to get your help in writing this legislation. Therefore, that's the import of the task that faces us today.

So we are going to welcome our witnesses. We have the agenda. It's a rather extensive agenda. I'm delighted with our first panel here, a satellite industry panel. I have a pretty good idea of what you guys are going to say, what all of you witnesses are going to say, and I think it's going to be enlightening. I think what we're going to do in the future when we have these kind of hearings is we're going to get the Government witnesses in the same room so they can hear your testimony, so we don't spread this out on two different days. They need to be hearing from you as we are looking forward to hearing from you, and they need to hear it directly, person-to-person, not necessarily through an intermediary. We will reorganize these kind of hearings in the future so that we can do that. I think that would be very instructive.

[The prepared opening statement of Mr. Walker follows:]

OPENING REMARKS OF
REPRESENTATIVE ROBERT S. WALKER
REPUBLICAN VICE CHAIRMAN
SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS
U. S. HOUSE OF REPRESENTATIVES

February 17, 1988

Good morning. Today we hold the second hearing on the needed amendments to the Commercial Space Launch Act to ensure that our infant commercial space launch industry has a reasonable chance to compete successfully in the world marketplace.

It is important that we remember that this nation already has a successful commercial space industry, and it is represented here today by our satellite industry witnesses. Following the tragic loss of the Challenger the administration decided to throw commercial payloads off the Space Shuttle. The reasons for that decision were that the Shuttle should be used for those payloads that require it's unique capabilities, and the determination that those commercial payloads could fly on commercial ELVs.

Today we need to determine what the launch requirements of the satellite industry are, and if those requirements can be met by domestic launch providers. That may require a fine balance between the interests of both sectors.

Yesterday we were told by government witnesses that there already exists sufficient insurance capacity to cover maximum probable losses to third parties in launch accidents. We want to test that assertion against the industry

experience. We were also told that the Administration position is that Congress should adopt comprehensive tort reform legislation to place caps on losses in accidents. Unfortunately, this Committee has no jurisdiction in the area of tort reform. That jurisdiction lies with the Committee on the Judiciary, and that Committee shows no indication that they are favorably disposed toward tort reform.

We are faced with a need to remove impediments that currently appear to face the launch industry. We need to move aggressively to ensure that American companies can compete on a level playing field. And we need to move to ensure that the billions of private dollars that have already been invested in our successful satellite industry are not lost in a migration overseas.

A successful commercial launch industry is the cornerstone of wide ranging space commercial sector. Our future can include a trillion dollar space based economy early in the next century, but that future must be based on a commercial launch industry that can provide the lift capacity to boost the space infrastructure to support those space commercial ventures.

Mr. NELSON. So, Mr. Roberts, and Mr. Crockett, and Mr. Hollis and Mr. Frey, we welcome you, and we'll just start in the order of the printed agenda. Mr. Roberts.

STATEMENTS OF GEORGE P. ROBERTS, PRESIDENT, CONTEL ASC; BRUCE L. CROCKETT, PRESIDENT, WORLD SYSTEMS DIVISION, COMMUNICATIONS SATELLITE CORP.; REX R. HOLLIS, PRESIDENT, FORD AEROSPACE SATELLITE SERVICES CORP.; AND JAMES H. FREY, GENERAL MANAGER, SPACECRAFT OPERATIONS, ASTRO SPACE DIVISION, GENERAL ELECTRIC CO.

Mr. ROBERTS. Mr. Chairman and distinguished members of the subcommittee, I appreciate the opportunity to be here today to represent Contel ASC and to offer our views on H.R. 3765, the Commercial Space Launch Act Amendments.

As you are aware, our company testified before this subcommittee in September regarding the importance of ensuring the existence of a competitive, domestic, private sector expendable launch vehicle program to fill the void created by the Government's unexpected abandonment of commercial launch services. The current bill is the first meaningful step toward that goal, and Contel ASC supports this effort. We commend Chairman Nelson, Congressman Walker, and all of the Members of Congress who have co-sponsored H.R. 3765 for your vision and leadership. We also want to commend the subcommittee staff for the hard work which is reflected in this legislation.

The introduction and consideration of this measure has been most timely and helpful because, in my judgment, unless we acknowledge the magnitude of the problems facing our commercial space initiative, the 1980's will be viewed as the decade in which the United States lost its preeminence in this area. To date, our Government's policies have not reflected the interdependence of a viable commercial launch industry and a viable commercial space industry. Unless these policies are changed, we will never realize the full potential of the opportunities presented by the use of space for commercial activities.

The only commercial space industry in existence today is the satellite communications industry. A decade of growth in that industry, however, stands threatened by the disastrous economic consequences of our national space policies. Some well-known facts will, I believe, make clear the impact of escalating launch costs, insurance premiums, and other unacceptable financial risks on the industry of which I am a part.

In 1983, 21 companies filed applications with the FCC for new satellite services, and 11 companies were provided with construction and launch authorizations. Some 18 satellites were constructed and launched, and the industry was approaching maturity. However, there has not been a single domestic U.S. communications satellite construction contract awarded since July 1985, and to my knowledge, none of the current licensees have even prepared a request for proposal or invested any significant capital in the acquisition of new satellite systems.

This reluctance on the part of entrepreneurs and current satellite operating companies to pursue future communications satellite

business has, I believe, a simple cause: prohibitive costs have erased the potential for any reasonable return on investment. My company has over the last two years experienced increases in the costs associated with launching satellites that run into the tens of millions of dollars. These increased costs simply cannot be passed through to our customers, and unless these unanticipated costs are addressed, our ability and the ability of our associates in the satellite communications industry to compete with other technologies is doubtful. Without a creative approach to this problem through changes in Government policies, and the enactment of new legislation, I believe that there will be no new commercial space industries, and the health of the sole existing entrant in the field—satellite communications—will be placed in jeopardy.

The introduction of the Commercial Space Launch Act Amendments gave us our first real hope that the commercial space industry would be rebuilt. The provisions of the bill which establish means by which the risks associated with launch activities may be shared and provide some protection against the preemption of satellite launches are important.

In addition, the bill encourages companies such as Contel ASC to seriously consider utilizing a U.S. ELV launch. The section which provides incentives to satellite owners whose contracts were not performed by NASA is helpful to us because, in return for contracting for an ELV launch, we may obtain third-party liability insurance for the price we had contracted to pay under the terms of our launch services agreement with NASA. That section also provides that steps will be taken to ensure that eligible satellites receive priority status for launch from United States launch sites.

I do not, however, want to give you the impression that we believe that H.R. 3765, as introduced, is completely responsive to our needs. I will take a moment to reacquaint you with Contel ASC and its business and to outline its relationship to the current bill as the owner of an eligible satellite.

As you know, Contel ASC is a telecommunications common carrier that operates a network comprised of hundreds of satellite Earth stations which serve industry and Government. Our Earth stations depend on the availability of satellite transponders in geosynchronous orbit to provide the essential connectivity that forms the Contel ASC custom-tailored communication networks.

In August 1984, Contel ASC signed a launch services agreement with NASA which obligated NASA to launch two ASC telecommunication satellites, ASC-1 and ASC-2. ASC-1 was launched by the shuttle on August 27, 1985. Prior to October 1986, ASC-2 had been manifested by NASA on the shuttle with a firm launch date of January 27, 1987.

In January 1986, the *Challenger* disaster took place. Following *Challenger*, we received assurances that the Government did not intend to abandon its obligation to Contel ASC. But in August, 1986, the President issued a policy statement indicating that the Government would no longer be in the business of launching commercial satellites and encouraging the establishment of the private ELV industry. In October 1986, NASA released the first space shuttle manifest following the loss of the *Challenger* which deleted ASC-2 from the list of satellites scheduled for shuttle launch. Also

in October NASA advised Contel ASC that NASA would not be providing launch services of any kind for ASC-2. The Government's failure to perform under its launch services agreement has left Contel ASC severely damaged to the extent of millions of dollars.

H.R. 3765 is a positive initiative taken to ensure the future of the commercial space industry. However, before the future is discussed, it is imperative that the Government make whole those satellite owners such as Contel ASC whose shuttle launch contracts were repudiated by NASA in 1986. In signing launch services agreements with companies such as Contel ASC, the Government made a binding commitment. It promised to ensure our access to space if we proceeded to make the investment in the satellite and prepay the associated launch costs. Contel ASC has fulfilled its part of the bargain.

Even after the *Challenger* accident, the Government continued to assure us that they would honor their contractual commitment to satisfy our launch requirements, whether by shuttle or a special procurement of expendable launch vehicles. On the basis of these continued assurances, we made no further contingency plans and continued to keep our faith in the Government. Unfortunately, our faith was misplaced. This action has cost Contel ASC and others in the satellite communications industry staggering sums of money. Today, companies such as Contel ASC have invested hundreds of millions of dollars in the design, development and acquisition of communication satellites. Some of these satellites, such as our ASC-2, have been completed and are currently in storage, with no reasonable likelihood of obtaining a timely and affordable launch.

As I indicated a few moments ago, H.R. 3765 provides necessary incentives to satellite owners such as Contel ASC. However, the bill is inadequate in its recognition of the huge increase in launch costs which has occurred since our LSAs with NASA were executed. Launch costs have more than doubled during the last two years. But the current bill provides only that the United States will not require payment for use of its launch property and services in connection with the launch of an eligible satellite. This partial credit compensates for only a fraction of the total increased launch costs that satellite owners now face.

Before companies like Contel ASC can fully commit to using U.S. ELVs under the current U.S. Government license program, we must be made whole for the overwhelming loss sustained due to NASA's breach of our LSAs. I am here today to ask that the bill be amended to provide us a voucher to cover increased launch costs for our eligible satellite.

Contel ASC supports Congressman Nelson's bill, but I suggest that the legislation contain a provision to fully indemnify those of us who have been severely damaged by changes in the administration's policy and by the Government's failure to honor its obligations under our previous launch agreements. I believe these recommended changes are essential to restore confidence in this Nation's space policy and program and will also strongly support the viability of the U.S. commercial ELV industry.

Thank you for the opportunity to appear before you today.

[The prepared statement of Mr. Roberts follows:]

February 17, 1988

Statement by
Mr. George P. Roberts
President
Contel ASC

on
H.R. 3765, the Commercial
Space Launch Act Amendments of 1987

before the

Subcommittee on Space Science and Applications
Committee on Science Space and Technology
United States House of Representatives

Mr. Chairman and Distinguished Members of the Subcommittee:

I appreciate the opportunity to be here today to represent Contel ASC and to offer our views on H.R. 3765, the Commercial Space Launch Act Amendments. As you are aware, our company testified before this Subcommittee in September regarding the importance of ensuring the existence of a competitive, domestic, private sector Expendable Launch Vehicle (ELV) program to fill the void created by the government's unexpected abandonment of commercial launch services. The current bill is the first meaningful step toward that goal, and Contel ASC supports this effort. We commend Chairman Nelson, Congressman Walker, and all of the members of Congress who have co-sponsored H.R. 3765 for your vision and leadership. We also want to commend the subcommittee staff for the hard work which is reflected in this legislation.

The introduction and consideration of this measure has been most timely and helpful because, in my judgment, unless we acknowledge the magnitude of the problems facing our commercial space initiative, the 1980's will be viewed as the decade in which the United States lost its preeminence in this area. To date, our government's policies have not reflected the interdependence of a viable commercial launch industry and a viable commercial space industry. Unless these policies are changed, we will never realize the full potential of the opportunities presented by the use of space for commercial activities.

The only commercial space industry in existence today is the satellite communications industry. A decade of growth in that industry, however, stands threatened by the disastrous economic consequences of our national space policies. Some well known facts will, I believe, make clear the impact of escalating launch

costs, insurance premiums, and other unacceptable financial risks on the industry of which I am a part. In 1983, 23 companies filed applications with the FCC for new satellite services, and 14 companies were provided with construction and launch authorizations. Some 16 satellites were constructed and launched, and the industry was approaching maturity. However, there has not been a single domestic U.S. communications satellite construction contract awarded since July, 1985, and to my knowledge, none of the current licensees have even prepared a request for proposal or invested any significant capital in the acquisition of new satellite systems.

This reluctance on the part of entrepreneurs and current satellite operating companies to pursue future communications satellite business has, I believe, a simple cause: prohibitive costs have erased the potential for any reasonable return on investment. My company has over the last two years, experienced increases in the costs associated with launching satellites that run into the tens of millions of dollars. These increased costs simply cannot be passed through to our customers, and unless these costs are addressed, our ability, and the ability of our associates in the satellite communications industry to compete with other technologies is doubtful. Without a creative approach to this problem through changes in government policies and the enactment of new legislation, I believe that there will be no new commercial space industries, and that the health of the sole existing entrant in the field ---- satellite communications---- will be placed in jeopardy.

The introduction of the Commercial Space Launch Act Amendments gave us our first real hope that the commercial space industry would be rebuilt. The provisions of the bill which establish means by which the risks associated with launch activities may be shared, and provide some protection against the preemption of satellite launches are important. In addition, the bill encourages companies such as Contel ASC to seriously consider utilizing a U.S. ELV launch. The section which provides incentives to satellite owners whose contracts were not performed by NASA is helpful to us because in return for contracting for an ELV launch, we may obtain third-party liability insurance for the price we had contracted to pay under the terms of our Launch Services Agreement with NASA. That section also provides that steps will be taken to ensure that eligible satellites receive priority status for launch from United States launch sites.

I do not, however, want to give you the impression that we believe that H.R. 3765, as introduced, is completely responsive to our needs. I will take a moment to reacquaint you with Contel ASC and its business, and to outline its relationship to the current bill as the owner of an "eligible satellite."

As you know, Contel ASC is a telecommunications common carrier that operates a network comprised of hundreds of satellite earth stations which serve industry and government. Our earth stations depend on the availability of satellite transponders in geosynchronous orbit to provide the essential connectivity that forms the Contel ASC custom tailored communication networks.

In August, 1984, Contel ASC signed a Launch Services Agreement with NASA, which obligated NASA to launch two ASC telecommunication satellites -- ASC-1 and ASC-2. ASC-1 was launched by the Shuttle on August 27, 1985. Prior to October, 1986 ASC-2 had been manifested by NASA on the Shuttle with a Firm Launch Date of January 27, 1987.

In January 1986, the Challenger disaster took place. Following Challenger, we received assurances that the government did not intend to abandon its obligation to Contel ASC. But in August, 1986 the President issued a policy statement indicating that the government would no longer be in the business of launching commercial satellites, and encouraging the establishment of the private ELV industry. In October 1986, NASA released the first Space Shuttle manifest following the loss of the Challenger, which deleted ASC-2 from the list of satellites scheduled for Shuttle launch. Also in October, NASA advised Contel ASC that NASA would not be providing launch services of any kind for ASC-2. The government's failure to perform under its Launch Services Agreement has left Contel ASC severely damaged to the extent of millions of dollars.

H.R. 3765 is a positive initiative taken to ensure the future of the commercial space industry. However, before the future is discussed, it is imperative that the government make whole those satellite owners such as Contel ASC whose shuttle launch contracts were repudiated by NASA in 1986. In signing Launch Services Agreements with companies such as Contel ASC, the government made a binding commitment. It promised to assure our access to space if we proceeded to make the investment in the satellite and prepay the associated launch costs. Contel ASC has fulfilled its part of the bargain. Even after the Challenger accident, the government continued to assure us that they would honor their contractual commitment to satisfy our launch requirements, whether by Shuttle or a special procurement of expendable launch vehicles. On the basis of these continued assurances, we made no further contingency plans and continued to keep our faith in the government. In return, our launch contracts were abandoned, costing the satellite communications industry staggering sums of money. Today companies such as Contel ASC have invested hundreds of millions of dollars in the design, development and acquisition of communication satellites. Some of these satellites, such as our ASC-2, have been completed and are currently

in storage, with no reasonable likelihood of obtaining a timely, affordable launch.

As I indicated a few moments ago, H.R. 3765 provides necessary incentives to satellite owners such as Contel ASC. However, the bill is inadequate in its recognition of the huge increase in launch costs which has occurred since our LSAs with NASA were executed. Launch costs have more than doubled during the last two years. But the current bill provides only that the United States will not require payment for use of its launch property and services in connection with the launch of an eligible satellite. This partial credit compensates for only a fraction of the total increased launch costs that satellite owners now face.

Before companies like Contel ASC can fully commit to using U.S. ELVs under the current U.S. government license program, we must be made whole for the overwhelming loss sustained due to NASA's breach of our LSAs. I am here today to ask that the bill be amended to provide us a full credit to cover increased launch fees for our eligible satellites.

Contel ASC supports Congressman Nelson's bill. But I suggest that the legislation contain a provision to fully indemnify those of us who have been severely damaged by changes in the Administration's policy and by the government's failure to honor its obligations under our previous launch agreements. Once we are made whole, all of us can then proceed together on this new venture that will revitalize space commercialization and help develop the U.S. commercial expendable launch vehicle industry.

Thank you for the opportunity to appear before you today.

George P. Roberts
CONTEL ASC

George P. Roberts is president of Contel ASC (formerly American Satellite Company), a subsidiary of Contel Corporation. He joined the company in 1984 as senior vice president of operations and engineering functions. He was appointed president in March 1985.

Mr. Roberts' career in telecommunications management and technology spans 25 years. Prior to joining Contel ASC, Roberts served as vice president and general manager of the Telecommunications Networks Division of Harris Corporation (1982-1984) where he was responsible for forming and managing a new division to address this specific market. Earlier in his career, he held senior management positions with RCA Alascom (1968-1982).

Mr. Roberts was born in Tucson, Arizona in 1932. He attended the University of Arizona where he received a Bachelor of Science in Electrical Engineering in 1960.

Mr. NELSON. Thank you.

Mr. Crockett.

Mr. CROCKETT. Mr. Chairman, thank you for inviting COMSAT to testify before the subcommittee today. I would like to also thank you and the cosponsors of your legislation for the strong leadership role you have taken in trying to improve commercial access to space.

COMSAT is in a unique position to comment on the commercialization of the launch industry and the effect of increased competition in this arena. As the U.S. signatory and the largest single owner of INTELSAT, we have been here since the dawn of the space age. INTELSAT has been by far NASA's biggest commercial customer for launch services through the years. We have seen every major change first hand along the way. There have been new competitive challenges from other nations to what heretofore had been NASA's exclusive province. There has been increased and decreased reliance on expendable launch vehicles. Now we enter the age of launch services provided by private industry. After two decades of dependence upon the Government, the decision to call upon private industry to provide launch services for commercial satellites is a major shift in policy. But those changes and policy decisions are behind us now. The question today is how can we make these new policies work while at the same time maintain U.S. preeminence in the field and enhance our industry's overall competitiveness.

Let me see if I can briefly sketch out the basic concerns that we have as a user of launch services. Then I will try to relate these concerns to the legislation at hand and make some suggestions on ways in which it might be improved.

INTELSAT has launched some 40 satellites in its history. Thirty-eight of these have been aboard U.S. launch vehicles. INTELSAT has contracted for two Titan launches in the 1988 to 1990 period which will be immediately affected by the proposed legislation. From a business perspective, our launch needs are basically the same as they've always been. First and foremost, we need reliability from and complete confidence in our launch provider. The deployment of each successive generation of satellites is timed to meet anticipated increased demand as well as to replace satellites whose design lives have expired. It is therefore essential that we have an orderly plan for launch and replacement of those satellites and that spare/redundant capacity always be in place. Based upon our experience, at least up until the recent series of launch failures, we have been able to predict a success-to-failure ratio for our launches, which is also factored into our overall plans. What cannot be predicted, and what places our business in greatest jeopardy, are unexpected and protracted launch delays.

When a new private launch service provider comes to us, the first thing we must ascertain is whether we can rely on this provider to deliver the launch vehicle on time and meet the proposed launch date. If the launch pad is owned and operated by the Government, we must also consider that the Government's plans and prerogatives may directly affect the ability of the launch provider to meet its schedule. The bill's protection from preemption except in the case of imperative national need, and its provision for liqui-

dated damages in the event of preemption, are certainly strong steps in the right direction. If this legislation enables U.S. providers to deliver successful and timely launch services, it will go a long way in maintaining U.S. leadership in space.

Concurrently, we look at price. This is a consideration that is of rising importance to us in a time of increased competition with fiber optic cable and other satellite providers. In this respect, we believe the current plans for use of Titan and Ariane vehicles to launch INTELSAT VI satellites is sound. It is no secret that foreign providers of launch services get help from their governments. The question for the U.S. is really twofold: now that commercial customers are turning to private industry for launch capabilities, what is our Government willing to do to help private industry remain competitive; second, is there anything currently proposed in your bill which might add unnecessary costs to the providers of private launch services? Insurance considerations immediately come to mind with respect to both of these questions.

As you are aware, foreign governments continue to provide indemnification for third party claims and, in fact, often sweeten the deal by offering launch options in the event of launch failure. Congress has recognized that it is not prudent to require licensees to bet the company in the event of a disaster in order to provide launch services. The shared risk approach proposed by your bill, which requires the Government to absorb claims in the unlikely event that the damages from a commercial launch exceed a statutory limit, is essential to a nascent private industry and will allow U.S. companies to compete effectively with launch providers whose governments currently give similar or complete protection for all such claims.

We all agree on the need for a competitive launch industry in this country. However, the 500 million dollar limit, which appears desirable in a vacuum, simply is not competitive in the world market in light of the limited insurance coverage now required by foreign providers, the cost and availability of domestic insurance coverage, and the extremely unlikely possibility of extensive damage from a catastrophic loss. Based on our experience, to become competitive, the underlying limits you propose must be significantly lower.

For example, we note that the cost of insurance with respect to the March, 1987 Palapa/Delta launch was approximately 300,000 dollars for the first 100 million of coverage, and 150,000 dollars for an additional 200 million. On this basis, the required 500 million dollars of underlying coverage proposed today would likely cost us over 500,000 dollars per launch. In the case of a launch with a foreign source, where the insurance requirements are much smaller—in one recent instance, 70 million—the costs were considerably less than 300,000. Quite clearly, then, the cost of insurance can be enough to make a competitive difference. We believe you should strive to lower the amount of third party liability coverage required of U.S. commercial launch service providers to enable U.S. industry to better compete with its foreign competitors.

As a related matter, we believe that some attention should be given to the possibility that a licensee may find that a source does not always exist to meet the statutory limits at reasonable prices,

especially in the area of third party claims. You may wish to consider adding a provision to the bill indicating that the underlying limits may be affected by the availability of excess liability insurance. We also support the idea of a three-year review of these underlying limits. We suggest it might be advisable to review the limits on an annual basis after the initial three-year review with an eye to adjusting the underlying limits as experience warrants.

COMSAT testified before you in July of 1986. At that time we suggested that a joint Government and industry effort should be undertaken to develop a new generation of reliable and less expensive rockets for commercial satellite launches. We suggested that the effort to develop these new rockets should be financed by both industry and Government as a counterbalance to foreign subsidy of foreign launchers. We note that section 9 of the bill requires NASA to design a program for the support of research into launch system component technologies. We believe that it is essential that a wider range of options be developed to ensure America's competitiveness in the years to come. We are aware of the extensive R&D efforts being undertaken by foreign launch providers. In order for us to maintain our competitive edge in space, it is absolutely imperative that a strong joint industry/NASA partnership revitalize the commitment to American superiority in the next millennium. Further consultations between NASA and the industry may be warranted to define the roles the two must play to meet the challenge.

The U.S. has reached a critical juncture in its efforts to move ahead with the commercialization of space. At stake is nothing less than the continued competitiveness of the U.S. space industry. We are in desperate need of a reliable commercial launch vehicle program. American preeminence in such a program is on the line, and the policies we adopt will determine whether the U.S. will be able to maintain its leadership in advancing the commercial uses of space. We believe this legislation will help restore its competitive balance necessary to ensure viability and success of the U.S. launch industry, and we look forward to working with you to ensure its passage.

Thank you very much.

[The prepedated statement of Mr. Crockett follows:]

Testimony
of
BRUCE L. CROCKETT
President, World Systems Division
COMMUNICATIONS SATELLITE CORPORATION
Before
Subcommittee on Space Science and Applications
Committee on Science, Space, and Technology
U.S. House of Representatives

February 17, 1988

Mr. Chairman, thank you for inviting COMSAT to testify before the Subcommittee today. I want to thank you and the co-sponsors of your legislation for the strong leadership role you have taken in trying to improve commercial access to space.

COMSAT is in a unique position to comment on the commercialization of the launch industry and the effect of increased competition in this arena. As the U.S. Signatory and largest single owner of INTELSAT we have been here since the dawn of the space age. INTELSAT has been by far NASA's biggest commercial customer for launch services through the years. We have seen every major change first-hand along the way. There have been new competitive challenges from other nations to what heretofore had been NASA's exclusive province. There has been increased and decreased reliance on expendable launch vehicles. Now we enter the age of launch services provided by private industry. After two decades of dependence on the government, the decision to call upon private industry to provide launch services for commercial satellites is a major shift in policy. But those changes and policy decisions are behind us now. The question today is how can we make these new policies work while at the same time maintain U.S. preeminence in this field and enhance our industry's overall competitiveness.

Let me see if I can briefly sketch out the basic concerns that we have as a user of launch services. Then I will try to relate these concerns to the legislation at hand and make some suggestions on ways in which it might be improved.

INTELSAT has launched some forty satellites in its history. Thirty-eight of those have been aboard U.S. launch vehicles. INTELSAT has contracted for two Titan launches in 1988-1990 which will be immediately affected by the proposed legislation. From a business perspective our launch needs are basically the same as they have always been. First, and foremost, we need reliability from, and complete confidence in, our launch provider. The deployment of each successive generation of satellites is timed to meet anticipated increased demand as well as to replace satellites whose design lives have expired. It is therefore essential that we have an orderly plan for launch and replacement of those satellites and that spare/redundant capacity always be in place. Based upon our experience, at least up until the recent series of launch failures, we have been able to predict a success-to-failure ratio for our launches, which is also factored into our overall plans. What cannot be predicted and what places our business in greatest jeopardy are unexpected and protracted launch delays.

Consequently, you can readily understand that we are disturbed by Section 5 of this bill which establishes a priority system for certain satellites. As you know, responsible members of the industry have sought to resolve their launch scheduling questions. The possibility of legislated scheduling mechanisms may adversely affect U.S. launch providers by disrupting current industry-negotiated schedules, inadvertently enhancing the competitive posture of foreign providers whose launch schedules are known and firm. As you can see, reliability and accurate scheduling are absolutely key considerations when pondering launch alternatives.

When a new private launch service provider comes to us, the first thing we must ascertain is whether we can rely on this provider to deliver the launch vehicle on time and meet the proposed launch date. If the

launch pad is owned and operated by the government, we must also consider that the government's plans and prerogatives may directly affect the ability of the launch provider to meet its schedule. The bill's protection from preemption except in the case of "imperative national need," and its provision for liquidated damages in the event of preemption are certainly strong steps in the right direction. If this legislation enables U.S. launch providers to deliver successful and timely launch services, it will go a long way in maintaining U.S. leadership in space.

Concurrently, we look at price. This is a consideration that is of rising importance to us in a time of increased competition with fiber optic cable and other satellite providers. In this respect, we believe the current plans for use of Titan and Ariane vehicles to launch INTELSAT VI satellites is sound. It is no secret that foreign providers of launch services get help from their governments. The question for the United States is really twofold. Now that commercial customers are turning to private industry for launch capabilities, what is our government willing to do to help private industry remain competitive. Second, is there anything currently proposed in your bill which might add unnecessary costs to the providers of private launch services? Insurance considerations immediately come to mind with respect to both of these questions.

As you are aware, foreign governments continue to provide indemnification for third-party claims and, in fact, often "sweeten" the deal by offering launch options in the event of launch failure. Congress has recognized that it is not prudent to require licensees to "bet the company" in the event of a disaster in order to provide launch services. The shared risk approach proposed by your bill, which requires the government to absorb claims in the unlikely event that the damages from a commercial launch exceed a statutory limit, is essential to a nascent private industry and will allow U.S. companies to compete effectively with foreign launch providers whose governments currently give similar or complete protection from such claims.

We all agree on the need for a competitive launch industry in this country. However, the \$500 million limit, while appearing desirable in a vacuum, simply is not competitive in the world market in light of the limited insurance coverage now required by foreign providers, the cost and availability of domestic insurance coverage, and the extremely unlikely possibility of extensive damages from a catastrophic loss. Based on our experience, to become competitive, the underlying limits you propose must be significantly lower.

For example, we note that the cost of insurance, with respect to the March 1987 Palapa/Delta launch, was approximately \$300 thousand for the first \$100 million of coverage and \$150 thousand for an additional \$200 million. On this basis, the required \$500 million of underlying coverage proposed today would likely cost us over \$500 thousand per launch. In the case of a launch with a foreign source, where the insurance requirements are much smaller (in one recent instance, \$70 million), the costs would be below \$300 thousand. Quite clearly then, the cost of insurance can be enough to make a competitive difference. We believe you should strive to lower the amount of third-party liability coverage required of U.S. commercial launch service providers to enable U.S. industry to better compete with foreign competitors.

As a related matter, we believe that some attention should be given to the possibility that a licensee may find that a source does not always exist to meet the statutory limits at reasonable prices--especially in the area of third-party claims. You may wish to consider adding a provision to the bill indicating that the underlying limits may be affected by the availability of excess liability insurance. We also support the idea of a three-year review of these underlying limits. We suggest it might be advisable to review the limits on an annual basis after the initial three-year review with an eye to increasing the underlying limits, if experience warrants.

COMSAT testified before you in July of 1986. At that time we suggested that a joint government and industry effort should be undertaken to develop a new generation of reliable and less expensive rockets for commercial satellite launches. We suggested that the effort to develop these new rockets should be financed by both industry and government as a counterbalance to foreign subsidy of some foreign launchers. We note that Section 9 of the bill requires NASA to design a program for the support of research into launch system component technologies. We believe that it is essential that a wider range of options be developed to ensure America's competitiveness in the years to come. You are aware of the extensive R&D efforts being undertaken by foreign launch providers. In order for us to maintain our competitive edge in space, it is absolutely imperative that a strong joint Industry-NASA partnership revitalize its commitment to American superiority into the next millennium. Further consultations between NASA and the industry may be warranted to define the roles the two must play to meet this challenge.

The U.S. has reached a critical juncture in its efforts to move ahead with the commercialization of space. At stake is nothing less than the continued competitiveness of the U.S. space industry. We are in desperate need of a reliable commercial launch vehicle program. American presence in such programs is on the line, and the policies we adopt will determine whether the U.S. will be able to maintain its leadership in advancing the commercial uses of space. We believe this legislation will help restore the competitive balance necessary to ensure that viability and success of the U.S. launch industry and we look forward to working with you to ensure its passage.

(0057)

Mr. NELSON. Thank you, Mr. Crockett.

Mr. Hollis.

Mr. HOLLIS. Mr. Chairman, members of the subcommittee, on behalf of Ford Aerospace, a wholly-owned subsidiary of Ford Motor Company, I am pleased to have the opportunity to comment on the Commercial Space Launch Act Amendments of 1987, H.R. 3765.

In our October the 5th, 1987 correspondence to the subcommittee concerning the status of the U.S. commercial launch industry, we discussed areas in which U.S. providers of commercial launch services are at a disadvantage in international competition. H.R. 3765 addresses the most important items of our concern, namely, required liability insurance, cross waiver of liability, reasonable and fair international competition, and Government support for research and development. We strongly support most of the provisions of this bill and offer the following comments and observations:

Many compelling reasons exist for the U.S. Government to take a proactive role in the development of a strong commercial launch industry. Competition among suppliers of launch services will produce technological innovation, favorable rates, customer-tailored terms and conditions, and will stimulate growth of satellite-based services. The impact on jobs and tax revenues will be significant, as will the positive effect on the international balance of payments.

From a strategic perspective, a healthy commercial launch capability will contribute to a more robust overall U.S. space program, while providing backup for shuttle and other Government launch requirements. The provisions of H.R. 3765 will significantly improve the competitive posture of the U.S. launch vehicle manufacturers, a necessary step if we are to regain our prominence as a world leader in space transportation.

Ford Aerospace designs, develops and manufactures communications satellites, weather satellites, and other spacecraft elements for the U.S. Government and commercial applications. More than 85 spacecraft have been built in our Palo Alto, California facility. As a manufacturer of space-associated products, our business is closely related to the availability and affordability of reliable space transportation.

We commend the efforts of both industry and Government for the significant progress achieved towards rebuilding the U.S. launch capability. Following Government decisions to privatize expendable launch vehicles, and make range and launch facilities available, the U.S. launch vehicle manufacturers displayed great confidence in the marketplace and faith in the Government by making heavy financial commitments prior to resolution of several outstanding problems. Measures provided by H.R. 3765 indicates that their faith and confidence was well placed.

The bill provides a balanced approach to liability insurance required of a licensee. It is consistent with Government certification of flightworthiness and the control of range safety, to include the destruction of errant vehicles. Government responsibility for range safety should not be divorced from responsibility for negligence or error while performing launch-related services.

These amendments also recognize the need for Government action to assure reasonable and fair international competition in

commercial space activities. Recent steps by the U.S. Trade Representative to consult with the European Space Agency regarding support of national launch systems reflect an awareness of this need. However, aggressive marketing activity by the Soviet Union and the People's Republic of China indicates the need for continuing Government attention to trade issues affecting our commercial launch service industry while in its vulnerable start-up phase.

In an effort to balance the international competitive equation in commercial launch services, there are strong arguments for the U.S. and NASA to work with the U.S. launch industries to enhance their competitiveness with foreign entities, such as Arianespace and the European Space Agency. It is not clear how the U.S. manufacturers can remain competitive if they must fund vehicle upgrades and develop new launcher without assistance, and it may be necessary for the U.S. Government to take the lead in funding new technology and development. This possibility is also foreseen and addressed by H.R. 3765.

While we generally support the 1987 amendments to the Commercial Launch Act, there are two areas in which we recommend clarification or change. The first is in section 16(a)(1)(D) and pertains to the discretionary authority of the Secretary of Transportation to enter into reciprocal waivers. This is a very positive step toward placing U.S. commercial launch industry on equal footing with their international competitors, and a welcome addition. However, uncertainty concerning the granting of such waivers could represent an impediment to business planning. We suggest the legislation state that the waivers will be granted in general, with exceptions deemed necessary specified in advance. This would serve to remove a certain amount of uncertainty and assist in planning.

The second change recommended by Ford Aerospace pertains to launch incentives discussed in section 5. The standdown following the Challenger accident and restrictions on commercial launches resulted in lost revenue and added costs for many companies—those holding unperformed launch service agreements, as well as those that had made deposits in anticipation of signing such an agreement. While it can be argued that special consideration is due these companies, Ford Aerospace believes there are more appropriate avenues of relief. Controversy can be anticipated over this provision, detracting from the contribution and promise of this legislation. Accordingly, Ford Aerospace suggests consideration of launch incentives be removed from the bill.

Mr. Chairman, you and your subcommittee produced legislation that adds significantly to the competitive strength of the U.S. commercial launch industry. You are to be congratulated on your understanding of the problems which must be overcome, and the steps you have taken to resolve them.

Again, I appreciate the opportunity to provide the views of Ford Aerospace on this important legislation.

[The prepared statement Mr. Hollis follows:]

TESTIMONY OF REX R. HOLLIS, PRESIDENT
FORD AEROSPACE SATELLITE SERVICES CORPORATION
BEFORE THE SPACE SCIENCE AND APPLICATIONS SUBCOMMITTEE
OF THE HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

February 17, 1988

Mr. Chairman and Members of the Subcommittee:

On behalf of Ford Aerospace, a wholly owned subsidiary of Ford Motor Company, I am pleased to have the opportunity to comment on the "Commercial Space Launch Act Amendments of 1987," H.R. 3765. In our October 5, 1987 correspondence to the Subcommittee concerning the status of the U.S. commercial launch industry, we discussed areas in which U.S. providers of commercial launch services are at a disadvantage in international competition. H.R. 3765 addresses the most important of these, namely required liability insurance, cross waivers of liability, reasonable and fair international competition, and government support for research and development. We support in principle the provisions in this bill, and offer the following comments and observations.

Many compelling reasons exist for the U.S. Government to take a pro-active role in the development of a strong commercial launch industry. Competition among suppliers of launch services will produce technological innovation, favorable rates, customer tailored terms and conditions, and will stimulate growth of satellite based services. The impact on jobs and tax revenues will be significant, as will the positive effect on the international balance of payments. From a strategic perspective, a healthy commercial launch capability will contribute to a more robust overall U.S. space program, providing backup for shuttle and other government launch requirements. The provisions of H.R. 3765 will significantly improve the competitive posture of U.S. launch vehicle manufacturers, a necessary step if we are to regain our prominence as a world leader in space transportation.

The Basis of Our Perspective

Ford Aerospace designs, develops, and manufactures communications satellites, weather satellites, and other spacecraft elements for the U.S. Government and commercial applications. More than 85 spacecraft have been built in our Palo Alto, California facility. As a manufacturer of space related products, our business is closely related to the availability and affordability of reliable space transportation.

The Role of Government in Commercial Launch Services

We commend the efforts of both industry and government, which have achieved significant progress toward rebuilding a U.S. launch capability. Following government decisions to privatize expendable launch vehicles and make range and launch facilities available, the U.S. launch vehicle

manufacturers displayed great confidence in the marketplace and faith in the government by making heavy financial commitments prior to resolution of several outstanding problem areas. Measures provided by H.R. 3765 indicates that their faith and confidence were well placed.

The bill provides a balanced approach to liability insurance required of a licensee. It is consistent with government certification of flightworthiness and the range safety control, including the destruction of errant vehicles. Government responsibility for range safety control implies responsibility for negligence or error while performing launch-related services. It is equally appropriate that the government assure the availability of sufficient insurance for launch-associated activities.

These amendments also recognize a need for government action to assure reasonable and fair international competition in commercial space activities. Recent steps by the U.S. Trade Representative to consult with the European Space Agency regarding support of national launch systems reflect an awareness of this need. However, aggressive marketing activity by the Soviet Union and the Peoples Republic of China indicates the need for continuing government attention to trade issues affecting the U.S. commercial launch services industry in its vulnerable start-up phase.

In an effort to balance the international competitive equation in commercial launch services, there are strong arguments for the U.S. and NASA to work with the U.S. launch industries to enhance their competitiveness with foreign entities, such as Arianespace and the European Space Agency. It is not clear how U.S. manufacturers can remain competitive while funding vehicle upgrades and developing new launchers without assistance, and it may be necessary for the U.S. government to take the lead in funding new technology and development. This possibility is also foreseen and addressed by H.R. 3765.

Suggested Additions or Deletions to H.R. 3765

While we generally support the 1987 amendments to the Commercial Launch Act, there are two areas in which we recommend change. The first is in Section 16(a)(1)(D) and pertains to the discretionary authority of the Secretary of Transportation to enter into reciprocal waivers. This is a very positive step toward placing the U.S. commercial launch industry on equal footing with their international competitors, and a welcome addition. However, uncertainty concerning the granting of such waivers could represent a serious impediment to business planning. Ford Aerospace recommends the legislation state that the waivers "shall" be granted, rather than "may" be granted as currently provided in the bill. If exceptions are deemed necessary, they should be specified in advance.

The second change recommended by Ford Aerospace pertains to launch incentives discussed in Section 5. The standdown following the Challenger accident, restrictions on commercial launches, and alteration of the Shuttle pricing policy resulted in lost revenue or added cost for many companies: those holding unperformed launch service agreements, as well as those that made deposits in anticipation of signing an agreement. While it can be argued that special consideration is due these companies, Ford Aerospace believes there are more appropriate avenues of relief. Controversy could be

anticipated over eligibility for the launch incentives, detracting from the contribution and promise of this legislation. Accordingly, Ford Aerospace suggests that Section 5 of H.R. 3765 be deleted in its entirety.

Conclusion

Mr. Chairman, you and the Subcommittee have produced legislation that adds significantly to the competitive strength of the U.S. commercial launch industry. *You are to be congratulated on your understanding of the problems which must be overcome and the steps you have taken to resolve them.*

Again, I appreciate the opportunity to provide the views of Ford Aerospace on this important legislation.

BIOGRAPHY

REX R. HOLLIS

Rex R. Hollis is President of Ford Aerospace Satellite Services Corporation (FASSC), a wholly-owned subsidiary of Ford Aerospace Corporation.

Mr. Hollis joined FASSC in August, 1983, coming from GTE Spacenet (formerly Southern Pacific Satellite Company), where he had been Vice President of Marketing since early 1982. Prior to that he had served for seven years as Vice President, Marketing of Southern Pacific Communications Company (SPRINT), where he was responsible for product planning, promotion, and sales. From 1973 to 1975 he was National Director, Marketing Planning and Development for the Westar satellite program of Western Union.

Before retiring as Lieutenant Colonel in 1973, Mr. Hollis served in the U.S. Air Force, primarily in the telecommunications field.

Mr. Hollis holds Bachelor and Master of Science degrees in Electrical Engineering from Oklahoma State University.

Mr. NELSON. Thank you, Mr. Hollis.

Mr. Frey.

Mr. FREY. Mr. Chairman, thank you. By way of further introduction, I am Jim Frey, the General Manager of the Valley Forge operation of the Astro Space Division.

GE's Astro Space Division is also pleased to have an opportunity today to comment on the amendments to the Commercial Space Act now under consideration by this committee. As you know, our Division now consists of the former Spacecraft Operations of the GE Company and the RCA Corporation. Together, our merged division has flown over 354 successful space missions over approximately the last quarter-century. We are a major supplier of commercial, military and civilian satellites in this country and we compete vigorously for foreign opportunities when they're available on a fair and competitive basis. We have over 40 satellites currently in our backlog and we have consistently made major investments with our own funds in the technology of spacecraft and launch support, particularly in the commercial arena.

Our history in the space industry predates NASA's, going back to the late 1950's, when we participated in the SCORE program, providing the radio equipment used to transmit the first recorded message from space. We later won the Government's first programs to develop three axis stabilized military communications and weather satellites and have been a principal supplier of these systems ever since. We also developed for NASA the first Earth resources satellite and we built all of their remaining satellites in that series.

However, I think we're particularly proud of our role in leading the development of the commercial space industry. The free world commercial space industry has benefited greatly from the technology emerging as a result of NASA and military space projects, and private investment from the U.S. competitive space industry. A commercial space industry now exists worldwide in communications and Earth observations images, and this is largely a result of Government and private investment in the United States.

Let me briefly mention now some of the private initiatives that we have taken in our country to contribute to this industry. Our Americom sister component has been a leader in providing video distribution by satellites for years. This component has also entered into agreement with McDonnell Douglas for a new generation of Thor Delta 3914 commercial launch vehicles, and I believe this marks the first time that private industry has set requirements and provided funds for the development of a launch vehicle.

At our own division, Astro, we have been instrumental in developing apogee kick motors to support commercial satellite launches and have made major investment commitments to exploit the shuttle for commercial launches. We developed the Shuttle Compatible Orbit Transfer Stage, called SCOTS, with our own funds, primarily to lift shuttle-boosted satellites to geo-synchronous orbit, and again primarily, though not solely, for the commercial market. We also developed an innovative spacecraft design called OMNISTAR, which was designed from the outset for shuttle compatibility and on-orbit maintenance by shuttle astronauts. We now have 16 unfilled orders for commercial and international spacecraft.

In the Earth resources area, we embraced the concept of commercialization by joining with Hughes in a unique joint venture to supply Landsat images to the public, and to provide future production of Landsat satellites.

However, today several trends beyond our control are acting to diminish the potential of the market which we have so long invested in. The *Challenger* disaster has precipitated a series of events which are threatening the American commercial market. Of course, the Government will no longer launch commercial satellites in the shuttle, and the availability and cost of third-party liability insurance is highly unpredictable. In this environment, both our military and our commercial customers sometimes request spacecraft producers to take responsibility for purchasing the launch vehicles and delivering satellites on orbit, thus further shifting the costs of risk management and insurance coverage to us, the satellite producers.

In this environment, each satellite producer must face the relatively remote but very costly risks without an adequate base to self-insure these risks by spreading the costs on a sound actuarial basis. At the current time, we cannot count on the insurance industry to help us with this risk management at dependable, reasonable, and predictable costs.

These factors are also, and perhaps particularly, impacting our ability to compete in the international market. Here the problems are aggravated by extraordinary subsidies provided by foreign governments to support broad strategic economic goals. These governments intercede in several ways—they provide insurance at low or no cost, they cap the liability assumed by the contractor for third party and property insurance, and/or they can subsidize recurring and nonrecurring costs directly.

The Soviets and the Chinese are offering truly extraordinary deals to American and foreign satellite suppliers for what I think are obvious strategic reasons. American satellite producers stand to be excluded from Western Bloc international opportunities if our European competitors are allowed to take advantage of these extraordinary terms, while we are not. GE's current bids for Australian and Intelsat Consortium Communications satellites may be affected by this situation. Section 8 of the amendment is vital to establish a coherent western policy toward the use of the Russian and Chinese boosters which could support western satellite programs. A failure to achieve its objective could deny the American launch vehicle and/or satellite industries an opportunity to compete for Western Bloc commercial satellite business.

Our experience in international markets has made it clear that our costs are lower than, perhaps much lower, than those of our European competitors. We do not seek or need cost subsidies. We do, however, ask our Government to help in ensuring a level playing field for us to compete in the high technology international business area.

We are really scrambling to sustain our commercial heritage in this environment by modifying our investments for the expendable launch vehicle era. One example is our recent agreement with Martin to purchase 15 Titans. This agreement should help us assure ELV availability and provide other competitive advantages,

such as scheduling priorities, of value to all our customers. This agreement entails some unusual risks for both GE and Martin, but will greatly assist our ability to bid both foreign and domestic satellite programs in the future.

We believe that the Commercial Launch Act of 1987 is a constructive step in ensuring continued United States space supremacy. It will help ensure that the satellite and ELV contractors, and satellite operators, can compete on more even terms with foreign competitors in the areas of property and third party liability costs. It also directs the executive branch, as I read it, to address the issue of subsidized, strategically priced, foreign launch vehicle prices which threaten the space industry and the technology position of the United States which we have invested so heavily in.

Now, in the written testimony I have submitted to the committee we have three specific comments on the language in the bill. I think the first and third of those are clarifications. I will comment briefly on the second one.

The caps on the amount of third party liability and property damage coverage established in the bill are a step in the right direction, as has been testified here. However, it assumes that the insurance market will offer the dollar capacity required at reasonable rates. We believe the bill should permit the Secretary to lower the caps if there is sufficient coverage available on the market at reasonable rates.

As you know, foreign launch programs receive substantial support from their governments. Arianespace is held harmless by ESA and the French government by third party claims above about 70 million dollars. Further, they protect against damage to the launch facilities above a level that is probably significantly less than even the maximum probable loss. But the problem is more severe with the Soviets and the Chinese. The Soviets and the Chinese governments assume all risk in the case of the Proton and Long March vehicles.

I will skip over section 3, as I said.

In summary, I think the bill is a good one. You can count on the General Electric Company being firmly committed to being a major supplier of spacecraft in every segment of the market. We believe our commitment will benefit the country by helping assure that the past investment, public and private, in space technology will provide foreign exports, sustain domestic employment, and help substantially to maintain our national technology base.

I want to thank you again for this opportunity to express our views, Mr. Chairman. It is, indeed, very important to our future. Thank you.

[The prepared statement of Mr. Frey follows:]

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STATEMENT OF

JAMES H. FREY
ASTRO SPACE DIVISION
GENERAL ELECTRIC COMPANY

BEFORE THE

HOUSE SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 17, 1988

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THE GENERAL ELECTRIC COMPANY'S ASTRO SPACE DIVISION IS PLEASED TO HAVE AN OPPORTUNITY TODAY TO COMMENT ON THE AMENDMENTS TO THE COMMERCIAL SPACE LAUNCH ACT NOW UNDER CONSIDERATION BY THIS COMMITTEE. AS YOU KNOW, THE ASTRO SPACE DIVISION CONSISTS OF THE FORMER SPACECRAFT OPERATIONS ORGANIZATION OF THE GENERAL ELECTRIC COMPANY AND THE ASTRO ELECTRONICS DIVISION OF RCA. OUR MERGED DIVISION HAS FLOWN 354 SUCCESSFUL SPACE MISSIONS OVER THE LAST QUARTER CENTURY. WE ARE A MAJOR SUPPLIER OF COMMERCIAL, MILITARY AND CIVILIAN SATELLITES IN THIS COUNTRY AND WE COMPETE VIGOROUSLY AND SUCCESSFULLY FOR FOREIGN BUSINESS WHERE FAIR COMPETITIVE OPPORTUNITIES EXIST. WE HAVE OVER 40 SATELLITES CURRENTLY IN PROCESS OF DESIGN, FABRICATION, AND TEST AND HAVE CONSISTENTLY MADE MAJOR INVESTMENTS WITH OUR OWN FUNDS IN THE TECHNOLOGY OF SPACECRAFT AND LAUNCH SUPPORT.

OUR HISTORY IN THE SPACE INDUSTRY PREDATES NASA'S, GOING BACK TO THE LATE 50'S, WHEN WE PARTICIPATED IN THE "SCORE" PROGRAM, PROVIDING THE RADIO EQUIPMENT USED TO TRANSMIT THE FIRST RECORDED MESSAGE FROM SPACE. WE LATER WON THE GOVERNMENT'S FIRST PROGRAMS TO DEVELOP THREE

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AXIS STABILIZED MILITARY COMMUNICATIONS AND WEATHER SATELLITES AND HAVE BEEN A PRINCIPAL SUPPLIER OF THESE SYSTEMS EVER SINCE. WE ALSO DEVELOPED FOR NASA THE FIRST CIVILIAN EARTH RESOURCES SATELLITES AND HAVE PRODUCED ALL OF THE SUBSEQUENT SPACECRAFT IN THIS SERIES.

GE IS PARTICULARLY PROUD, HOWEVER, OF OUR ROLE IN LEADING THE DEVELOPMENT OF THE COMMERCIAL INDUSTRY. THE FREE WORLD COMMERCIAL SPACE INDUSTRY HAS BENEFITED GREATLY FROM TECHNOLOGY EMERGING AS A RESULT OF NASA AND MILITARY SPACE PROJECTS, AS WELL AS PRIVATE INVESTMENT BY THE COMPETITIVE U.S. INDUSTRIAL BASE. A COMMERCIAL SPACE INDUSTRY NOW EXISTS WORLDWIDE IN COMMUNICATIONS AND EARTH OBSERVATIONS, LARGELY AS A RESULT OF THIS AMERICAN INVESTMENT.

LET ME BRIEFLY MENTION NOW SOME OF OUR PRIVATE INVESTMENT INITIATIVES WHICH HAVE CONTRIBUTED GREATLY TO THIS INDUSTRY. GE AMERICOM HAS BEEN A LEADER IN PROVIDING VIDEO DISTRIBUTION VIA SATELLITES FOR YEARS AND HAS JOINED WITH MacDONNELL DOUGLAS TO SHARE IN THE FUNDING OF

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A NEW GENERATION OF THE THOR DELTA 3914 COMMERCIAL LAUNCH VEHICLES. THIS MARKS THE FIRST TIME PRIVATE INDUSTRY HAS SET DESIGN REQUIREMENTS AND PROVIDED FUNDS FOR THE DEVELOPMENT OF A LAUNCH VEHICLE. AT ASTRO, WE HAVE BEEN INSTRUMENTAL IN DEVELOPING APOGEE KICK MOTORS TO SUPPORT COMMERCIAL SATELLITE LAUNCHES AND HAVE MADE MAJOR INVESTMENT COMMITMENTS TO EXPLOIT THE SHUTTLE FOR COMMERCIAL LAUNCHES. WE DEVELOPED THE SHUTTLE COMPATIBLE ORBIT TRANSFER STAGE (SCOTS) TO LIFT SHUTTLE BOOSTED SATELLITES TO GEO-SYNCHRONOUS ORBIT. WE ALSO DEVELOPED AN INNOVATIVE SPACECRAFT DESIGN, CALLED "OMNISTAR", WHICH WAS DESIGNED FROM THE OUTSET FOR SHUTTLE COMPATIBILITY AND ON-ORBIT MAINTENANCE VIA SHUTTLE ASTRONAUTS. WE NOW HAVE 16 UNFILLED ORDERS FOR COMMERCIAL AND INTERNATIONAL SPACECRAFT.

IN THE EARTH RESOURCES AREA, WE EMBRACED THE CONCEPT OF COMMERCIALIZATION BY JOINING WITH HUGHES IN A UNIQUE JOINT VENTURE TO SUPPLY LANDSAT IMAGES TO THE PUBLIC, AND TO PROVIDE FUTURE PRODUCTION OF LANDSAT REPLACEMENT SATELLITES. WHILE THIS ACTIVITY HAS BEEN

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BUFFETED BY THE POLITICAL AND BUDGETING PROCESS, THE ECONOMICS OF REMOTE IMAGING HAVE BEEN MADE AVAILABLE TO GOVERNMENT AND PRIVATE USERS IN TERMS OF LOWER COSTS AND FASTER RESPONSE.

TODAY, SEVERAL TRENDS BEYOND OUR CONTROL ARE ACTING TO DIMINISH THE POTENTIAL OF THE MARKET WHICH WE HAVE SO LONG INVESTED IN. THE CHALLENGER DISASTER HAS PRECIPITATED A SERIES OF EVENTS WHICH ARE THREATENING THE AMERICAN COMMERCIAL MARKET. THE GOVERNMENT WILL NO LONGER LAUNCH COMMERCIAL SATELLITES ON THE SHUTTLE, AND THE AVAILABILITY AND COST OF PROPERTY AND THIRD PARTY LIABILITY INSURANCE IS HIGHLY UNPREDICTABLE. IN THIS ENVIRONMENT, BOTH OUR MILITARY AND COMMERCIAL CUSTOMERS ARE TENDING TO DEMAND THE SPACECRAFT PRODUCERS TAKE RESPONSIBILITY FOR PURCHASING THE LAUNCH VEHICLES AND DELIVERING SATELLITES ON-ORBIT, THUS FURTHER SHIFTING THE COSTS OF RISK MANAGEMENT AND INSURANCE COVERAGE TO THE PRODUCERS. IN THIS ENVIRONMENT, EACH SATELLITE PRODUCER MUST FACE THE RELATIVELY REMOTE BUT VERY COSTLY RISKS WITHOUT AN ADEQUATE BASE TO SELF-INSURE THESE RISKS BY SPREADING THE COSTS ON A SOUND ACTUARIAL BASIS. AT THE CURRENT TIME, WE CANNOT

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COUNT ON THE INSURANCE INDUSTRY TO HELP US WITH THIS RISK MANAGEMENT PROBLEM AT REASONABLE AND PREDICTABLE COSTS.

THESE FACTORS ARE ALSO IMPACTING OUR ABILITY TO COMPETE IN THE INTERNATIONAL MARKET. HERE THE PROBLEMS ARE AGGRAVATED BY EXTRAORDINARY SUBSIDIES PROVIDED BY FOREIGN GOVERNMENTS TO SUPPORT BROAD STRATEGIC ECONOMIC GOALS. THESE GOVERNMENTS INTERCEDE IN SEVERAL WAYS; THEY PROVIDE INSURANCE AT LOW OR NO COST, THEY CAP THE LIABILITY ASSUMED BY THE CONTRACTOR FOR THIRD PARTY AND PROPERTY INSURANCE, AND/OR THEY CAN SUBSIDIZE RECURRING AND NONRECURRING COSTS.

THE SOVIETS AND THE CHINESE ARE OFFERING TRULY EXTRAORDINARY LAUNCH DEALS TO AMERICAN AND FOREIGN SATELLITE SUPPLIERS FOR OBVIOUS STRATEGIC REASONS. AMERICAN SATELLITE PRODUCERS STAND TO BE EXCLUDED FROM WESTERN BLOC INTERNATIONAL OPPORTUNITIES IF OUR EUROPEAN COMPETITORS ARE ALLOWED TO TAKE ADVANTAGE OF THESE EXTRAORDINARY TERMS, WHILE WE ARE NOT. GE'S CURRENT BIDS FOR AUSTRALIAN AND INTELSAT CONSORTIUM COMMUNICATIONS

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SATELLITES MAY BE AFFECTED BY THIS SITUATION. SECTION 8 OF THE AMENDMENT IS VITAL TO ESTABLISH A COHERENT WESTERN POLICY TOWARD THE USE OF THE RUSSIAN AND CHINESE BOOSTERS WHICH COULD SUPPORT WESTERN SATELLITE PROGRAMS. A FAILURE TO ACHIEVE ITS OBJECTIVE COULD DENY THE AMERICAN LAUNCH VEHICLE AND SATELLITE INDUSTRIES AN OPPORTUNITY TO COMPETE FOR WESTERN BLOC COMMERCIAL SATELLITE BUSINESS.

OUR EXPERIENCE IN INTERNATIONAL MARKETS HAS MADE IT CLEAR THAT OUR COSTS ARE LOWER THAN THOSE OF OUR EUROPEAN COMPETITORS. WE DO NOT NEED, OR SEEK, COST SUBSIDIES. WE DO, HOWEVER, ASK OUR GOVERNMENT TO HELP IN INSURING A LEVEL PLAYING FIELD FOR US TO COMPETE IN THIS HIGH TECHNOLOGY INTERNATIONAL BUSINESS ARENA.

WE ARE SCRAMBLING TO SUSTAIN OUR COMMERCIAL HERITAGE IN THIS ENVIRONMENT BY MODIFYING OUR INVESTMENTS FOR THE NEW EXPENDABLE LAUNCH VEHICLE ERA. ONE EXAMPLE IS OUR RECENT AGREEMENT WITH MARTIN TO PURCHASE 15 TITANS. THIS AGREEMENT SHOULD ASSURE ELV AVAILABILITY AND PROVIDE

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OTHER COMPETITIVE ADVANTAGES, SUCH AS SCHEDULING PRIORITIES OF VALUE TO ALL OF OUR CUSTOMERS. THIS AGREEMENT ENTAILS SOME UNUSUAL RISKS FOR BOTH GE AND MARTIN, BUT WILL GREATLY ASSIST OUR ABILITY TO BID BOTH FOREIGN AND DOMESTIC SATELLITE PROGRAMS IN THE FUTURE.

WE BELIEVE THAT THE COMMERCIAL SPACE LAUNCH ACT AMENDMENT OF 1987 IS A CONSTRUCTIVE STEP IN INSURING CONTINUED UNITED STATES SPACE SUPREMACY IN THE NEW FRONTIER OF SPACE COMMERCIALIZATION. IT WILL HELP INSURE THAT AMERICAN SATELLITE AND ELV CONTRACTORS, AND SATELLITE OPERATORS, CAN COMPETE ON MORE EVEN TERMS WITH FOREIGN COMPETITORS IN THE AREAS OF PROPERTY, THIRD PARTY LIABILITY AND COSTS. IT ALSO DIRECTS THE EXECUTIVE BRANCH TO ADDRESS THE ISSUE OF PRIVATELY SUBSIDIZED, STRATEGICALLY PRICED, FOREIGN LAUNCH VEHICLE PRICES WHICH THREATEN THE SPACE INDUSTRY AND TECHNOLOGICAL POSITION WHICH THE U.S. HAS ESTABLISHED.

I WOULD LIKE TO OFFER SEVERAL OTHER SPECIFIC COMMENTS CONCERNING THE PRESENT WORDING OF THE AMENDMENT.

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1. THERE IS SOME AMBIGUITY REGARDING THE PROTECTION EXTENDED TO THE SATELLITE OWNER OPERATOR IN THE EVENT THAT THE ELV CONTRACTOR ELECTS TO SELF-INSURE. THE BILL SHOULD CLEARLY STATE THAT IF THIS OPTION IS ELECTED BY THE ELV CONTRACTOR, THEN THE SAME OR EQUIVALENT PROTECTION SHALL BE MADE AVAILABLE TO THE SATELLITE OWNER OPERATOR AND HIS CONTRACTORS AS WOULD HAVE ACCRUED IF THE ELV CONTRACTOR HAD OBTAINED INSURANCE.
2. THE CAPS ON THE AMOUNT OF THE THIRD PARTY LIABILITY AND PROPERTY DAMAGE COVERAGE ARE A STEP IN THE RIGHT DIRECTION, HOWEVER, IT ASSUMES THAT THE INSURANCE MARKET WILL OFFER THE DOLLAR CAPACITY REQUIRED AT REASONABLE RATES. WE BELIEVE THE BILL SHOULD PERMIT THE SECRETARY TO LOWER THE CAPS IF THERE IS INSUFFICIENT COVERAGE AVAILABLE IN THE MARKET AT REASONABLE RATES. AS YOU KNOW, FOREIGN LAUNCH PROGRAMS RECEIVE SUBSTANTIAL SUPPORT FROM THEIR GOVERNMENTS. ARIANESPACE IS HELD HARMLESS BY ESA AND

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THE FRENCH GOVERNMENT FROM THIRD PARTY CLAIMS ABOVE 4 HUNDRED MILLION FRANCS (APPROX. \$70M). FURTHER, THEY PROTECT AGAINST DAMAGE TO LAUNCH FACILITIES ABOVE A LEVEL THAT IS SIGNIFICANTLY LESS THAN EVEN THE MAXIMUM PROBABLE LOSS. BOTH THE SOVIET AND CHINESE GOVERNMENTS ASSUME ALL RISK IN THE CASE OF PROTON AND LONG MARCH LAUNCH VEHICLES. THE UNITED STATES MUST REMAIN ALERT TO FOREIGN COMPETITION THAT, THROUGH GOVERNMENT SUBSIDIES, THREATENS TO DESTROY OUR DESIGN AND MANUFACTURING INFRASTRUCTURE.

3. SECTION 5 OF THE AMENDMENT PROVIDES CERTAIN LAUNCH INCENTIVES FOR SATELLITES WHICH HAD AN UNPERFORMED LAUNCH SERVICE AGREEMENT WITH NASA AS OF AUGUST 15, 1986. AS WRITTEN, THIS LANGUAGE MAY EXCLUDE SATELLITES WHICH HAD BEEN COMPLETED, BUT NOT LAUNCHED, AS OF THAT DATE. THE WORDING SHOULD BE CLARIFIED TO INCLUDE THESE SATELLITES.

IN SUMMARY, LET ME SAY THAT THE NEW ASTRO SPACE DIVISION OF THE GENERAL ELECTRIC COMPANY IS FIRMLY COMMITTED TO BEING A MAJOR SUPPLIER OF SPACECRAFT IN EVERY SEGMENT OF THE MARKET. WE BELIEVE OUR COMMITMENT WILL BENEFIT THE COUNTRY BY HELPING TO ASSURE THAT OUR PAST INVESTMENT IN SPACE TECHNOLOGY WILL PROVIDE FOREIGN EXPORTS, SUSTAINED DOMESTIC EMPLOYMENT, AND HELP SUBSTANTIALLY TO MAINTAIN OUR NATIONAL TECHNOLOGY BASE IN THE FUTURE. THE CURRENT STATE OF THE U.S. LAUNCH INDUSTRY, THE UNPREDICTABLE CHARACTER OF FUTURE INSURANCE COVERAGE, AND THE EXISTENCE OF SEVERAL FOREIGN GOVERNMENT SUBSIDIZED LAUNCH SUPPLIERS AND SPACECRAFT COMPETITORS TOGETHER ARGUE FOR SUPPORT OF THE AMENDMENT UNDER CONSIDERATION HERE. I AGAIN THANK YOU FOR THIS OPPORTUNITY TO STATE OUR VIEWS ON THIS MATTER WHICH IS SO IMPORTANT TO OUR FUTURE SUCCESS.

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JAMES H. FREY

General Manager
Spacecraft Operations
Astro Space Division
Valley Forge, Pennsylvania

Jim was born in Baltimore, Maryland on March 6, 1938 and was raised in Towson, Maryland. He attended Duke University where he received his BSEE degree in 1960. He subsequently joined General Electric Company on the Engineering and Science program and had program assignments in Pittsfield (Distribution Transformer Department), Lynn, Massachusetts (Aircraft Engine Department), Salem, Virginia (Industrial Controls Department), and Philadelphia (Missile and Space Vehicle Department). He graduated from the GE "A" courses and BMC course and has done graduate work at Penn State and Brooklyn Polytechnic Institute.

He has held a number of positions in Engineering Management and Program Management in the Spacecraft and Data System businesses. He was the Program General Manager of Defense Communication Programs and the Manager of Engineering for Spacecraft Operations before assuming his current position as General Manager, Spacecraft Operations in Valley Forge in the new Astro Space Division.

Mr. NELSON. Thank you, Mr. Frey.

Let's turn to our members for their questions. Mr. Skaggs.

Mr. SKAGGS. Thank you, Mr. Chairman.

I appreciate the testimony from all of you gentlemen. I'm sorry I missed Mr. Roberts' presentation. I did notice in your prepared testimony the point that essentially you believe the United States Government should make whole—I think were your words—those firms such as your own that was harmed by the delays inherent since the shuttle disaster.

Do you mean that literally, in terms of a Government responsibility to put the company in the position that it would have been in had nothing happened in the last two years?

Mr. ROBERTS. We are exploring every avenue toward that goal. Part of our concern is that we've been in the business of supplying corporate and Government telecommunications via satellite for over 10 years, and we turned profitable in 1983, and we did our business planning on an ongoing basis based on contractual agreements that we had with the U.S. Government. When we look at our business planning now and, say, substitute the existing launch price today for what we had as a committed price from the U.S. Government then, the business would not be viable. And so what we're saying is we relied on that heavily and somebody, you know, did not fulfill their obligations and we're looking for some relief, yes.

Mr. SKAGGS. Does that strike you at all as inconsistent with the whole shared risk approach, of apportioning risk and liability among those that were participating with NASA in the shuttle program as a launch vehicle?

Mr. ROBERTS. Well, I think if you know or can predict the risks going forward, that's a normal part of your business, of running a business. And we are not risk averse, obviously, because we're in a risky business. But what you try to do is you try to eliminate as many risks as you can, and the way you do that is go to contract with somebody. If somebody does not meet their contractual obligations, then there should be some kind of—some kind of solution to that.

Mr. SKAGGS. Mr. Hollis, I believe in your statement you said you felt there were more appropriate means of relief than the launch incentive provisions that are included in the bill. I'm wondering if you could elaborate on some of those more appropriate means for us.

Mr. HOLLIS. My background doesn't include a lot of judicial training, sir, so I'll have to put that out first. I think that possibly going to the agency itself, and if that didn't work, then the Federal district court. But I really do not know what those best sources of relief might be. Our concern primarily is one that this bill might be bogged down because of controversy concerning that.

Mr. SKAGGS. So you're really looking at legal remedies outside of anything that might be included in this legislation?

Mr. HOLLIS. That certainly is one of the suggestions, or possibly even other legislation. But this particular bill is so important that we really just don't want to see it get bogged down over that type of discussion or argument.

Mr. SKAGGS. I'm assuming you all wouldn't want to see this sort of legislation get bogged down by a controversy over a third party liability cap such as included in the administration's proposal.

Mr. HOLLIS. I feel that there is a level of cap. There has to be a maximum risk some way defined. I think—Is your question aimed at where the relief comes from the administration proposal as opposed to this bill?

Mr. SKAGGS. No, no, that as you wish to see this bill cleaned of anything that might bog it down in this relief provision, I assume you also would rather not see the issue of tort reform liability caps being introduced as a complicating issue, as the administration's proposal announced recently would have us do.

Mr. HOLLIS. I'm not really prepared to state how much bogged down or delay might be introduced by tort reform legislation. I do believe that relief is so important that, either in the administration's approach or in this bill, we must have that form of relief—or cap. I guess that's not a popular word. But anyway, some form of balanced approach to the liability.

If the tort reform should, indeed, bog down the bill or delay the action, then I would certainly be opposed to going that route.

Mr. SKAGGS. Thank you.

Mr. Frey, just one point I would like to clarify—and I may not be reading the bill correctly. But you made the point that the Secretary should be authorized to lower the maximum financial responsibility or insurance caps that are mentioned. It seems to me the bill provides that they are maximums and that, by implication, anyway, there is discretion to require less than the maximum stated in the bill. Am I misreading that?

Mr. FREY. Well, perhaps I am, sir. We did not read it that way. It appeared to be a minimum cap, one which we think is adequate at this time; but future developments in the insurance industry may make those amounts inappropriate and we think the Secretary ought to have the opportunity and the flexibility to modify those caps.

Mr. SKAGGS. Well, in both instances it reads "in no event shall a licensee be required to obtain liability insurance or demonstrate responsibility" et cetera, "in an amount which exceeds 500 million dollars." So that seems to me already address the point. But perhaps we need to look at that further.

Thank you very much, Mr. Chairman.

Mr. NELSON. Thank you, Mr. Skaggs.

Mr. Walker, we will insert in the record your opening statement.

Mr. WALKER. Thank you, Mr. Chairman.

There seems to be some disagreement on the panel with regard to section 5 of the bill. Mr. Roberts, as I understand your position, you're for section 5 because you have a satellite that would be—that has been delayed as a result of the Challenger accident, and because of the administration's decision not to fly satellites aboard the shuttle, you have a problem.

Is there anybody else on the panel that has that same problem? I gather not. So, in other words, the position of the other companies is that that priority assigned to those types of satellites would, in fact, give you a problem with regard to future business that you

may be getting in place or already have in place with regard to the priority given to their flight; is that an accurate representation?

Mr. Frey?

Mr. FREY. Could you clarify your question there just a bit? Are you talking about the—what's the word that is used—the privileged satellite?

Mr. WALKER. Yeah. Section 5 is the part of the bill which gives priority to those satellites that were off-loaded from the shuttle, so that they have a priority flight schedule. And—

Mr. FREY. Astro is basically satisfied with that. Our written comments do suggest that the definition of that be modified slightly to include those under construction, as well as those completed at the time that the policy was changed. And I think that's a semantic clarification rather than a substantial difference of opinion. Other than that, we have no problem with that—with those provisions.

Mr. WALKER. Mr. Crockett?

Mr. CROCKETT. Thank you.

COMSAT, through INTELSAT and INMARSAT, has some satellites that fall into that category, but just because of that we don't necessarily associate ourselves with that provision, in the sense that after the shuttle accident, we went out and made alternate arrangements, a number of arrangements, so that we would be in a position to launch our satellites if and when the appropriate time came. And now, to have the U.S. Government come back after the fact two years later and legislate a priority schedule, when most firms' schedules are set and they've made contractual arrangements and so on and so forth, may add a level of complexity and disruptiveness to things that would be unwarranted. So I'm caught in kind of an unusual position of being privileged but wondering whether you're really helping those who are privileged in the process.

Mr. WALKER. Yes, Mr. Roberts, go ahead.

Mr. ROBERTS. I'd like to point out that while I may be alone in that on the panel, we feel like we have been directly damaged where maybe the other participants haven't. And I would also like to point out that we are an unregulated common carrier who is in a competitive arena with other people in competition. We have no regulated—we have no rate base, as such. So when a cost increases the magnitude that this cost increased, it really does affect us. It affects our customers, it affects the way we can compete. So that's probably why we have a little more interest in section 5 than the others.

Mr. WALKER. Well, I guess what I'm trying to figure out is as we move into a commercial marketplace, it seems to me that the role of Congress is not to define the commercial marketplace but to allow the commercial marketplace to develop as free from Government interference as possible. And let me try to explore it from this angle. Each of you are businessmen.

If, for example, you had a contract with an airline that went bankrupt, in the present commercial marketplace, would you be assigned a priority by some other airline because the airline that you happened to have a contract with went bankrupt?

So, in other words, in flight schedules as we now routinely have them in air travel, that is not something that would be done and,

in fact, it would be seen as an interference in the marketplace if Congress, in fact, mandated a priority for those people who happen to be on a bankrupt airline; isn't that correct?

Go ahead, Mr. Roberts.

Mr. ROBERTS. I think the difference is there's an alternative here, and the contracting party with us to launch didn't go bankrupt.

Mr. WALKER. Well, except that we had a massive failure which resulted in a total change in the commercial climate. If I understood Mr. Crockett correctly, what he's saying is that some commercial companies responded by understanding that there had been a big change and went ahead and made other arrangements. Now, because they made other arrangements, we put them at a competitive disadvantage because then Congress walks in and decides that no, we're going to hold harmless people who didn't make such arrangements.

Now, that is different from the way in which we would typically handle the commercial marketplace is my point. That's what I'm trying to feel out. Yes, go ahead.

Mr. ROBERTS. We made alternate arrangements, but the condition of the launch industry at the time was such that I believe that our reservation on a non-American ELV is in the 1991 time frame, and that's a four-year delay. Four years equals about half the life of a satellite. So we made similar type arrangements to go on an alternate basis, but that does not mean that our business was not severely damaged by first the delay and second, the drastic increase in cost.

Mr. WALKER. But it seems to me Mr. Frey makes the point that, if we don't include satellites already under construction, they're going to run into exactly the same problem, that their time schedule then with this prioritization is going to be shoved out two, three, four years. And so you will again be dealing with half the life of those satellites that are already under construction under contract. Is that a fair representation, Mr. Frey?

Mr. FREY. Yes I think so. I think there's a fairness issue—this is not a very critical issue for us as a producer, the Astro Space Division as a producer. I think there's a fairness issue here for the people that had an agreement with the Government which was abrogated. But there has been a nonbankrupt party, it seems to me, that has made a commitment under which some people have entered into this business. We've been fortunate enough to sell those people satellites, and then they've been left in, frankly, a worse position than we as a producer have been. So in that context, I think it's a—

Mr. WALKER. The reason why I'm exploring it is because there does seem to be some disagreement within the industry, and it's something that we're going to have to resolve as a panel. Maybe my prime question should be, how much disruption is section 5 going to cause? Is it minimal disruption, is it significant disruption? Is it something that we shouldn't be very worried about? I just got the impression there was a difference in testimony here that I'm trying to resolve.

Mr. FREY. I think there's probably a difference in interest between the producers of satellites and the operators of satellites. As a producer, these privileged satellites represent somewhat a threat

to us because they can preempt future launches and reduce our ability to provide launch capability for our future customers. It threatens that in some degree. However, I think we recognize that there's—

Mr. WALKER. To a minimal degree or to a significant degree?

Mr. FREY. We think to an acceptable degree, as it is now worded.

Mr. WALKER. To an acceptable degree?

Mr. FREY. To an acceptable degree, as it is now worded.

Mr. WALKER. Mr. Hollis—

Mr. HOLLIS. We want to see it greatly expanded.

Mr. WALKER. Is this a minimal problem or an acceptable problem?

Mr. HOLLIS. Sir, I think one of the major problems I have, or Ford Aerospace has with this bill, is the evenhandedness in which it could be administered. As we have seen, the situation has changed radically since 1986. Many people have moved ahead, some people haven't. Could we evenhandedly take care of the ones who haven't moved ahead as compared to the people who have?

The disruption relative to the priority of schedule could be a problem, and I could hypothesize a situation where if we had a customer who was trying to—where timing was important with him on his launch—he might be preempted by a satellite that had been given benefit from this incentive. That could be a problem. I am hesitant to attempt to fix a degree to that problem, though.

Mr. WALKER. Mr. Crockett?

Mr. CROCKETT. I don't think it's the most important item in the bill. In fact, I purposely didn't talk about section 5 in my prepared remarks because I wanted to have discussion on the issue of competitiveness, foreign governments subsidizing their launches and our ability to compete and meet that requirement.

Mr. WALKER. So it's a fairly minimal problem from your viewpoint, and Mr. Roberts, you see it as a crucial factor in the bill; is that correct?

Mr. ROBERTS. I think it's important from the standpoint of giving the industry a signal, that when the Government contracts to do something, they will live up to their expectations and will give the industry some confidence going forward, that the next time something happens all bets are off and everybody's business is severely impacted.

One of the things that we haven't talked about is if, in fact, we go forward with our alternate arrangement here and launch our satellite in 1991, very bluntly, we're launching old technology, because we all know technology doesn't stand still. If we were going to launch a satellite in 1991, it would not be the same satellite technically as the one we have in storage right now trying to get launched. So we've got a triple problem: one, that the launch costs have increased drastically; two, it's been delayed so that we cannot operate our business as we anticipated, because we have our customer base that can't be accommodated; and three, the technology is moving ahead while our satellite is in storage.

So I think it's crucial to give some indication that the Government does stand on what they have committed to do. I think the industry will be more comfortable if that sort of thing is done.

Mr. WALKER. Thank you, Mr. Chairman.

Mr. NELSON. Mr. Volkmer.

Mr. VOLKMER. Thank you very much, Mr. Chairman.

I would first like to ask Mr. Roberts, have you contacted Martin Marietta for a launch on the Titan?

Mr. ROBERTS. Yes, we've talked to everybody that's in the business, including the Red Chinese—

Mr. VOLKMER. Pardon?

Mr. ROBERTS. Including the Chinese and the Russians.

Mr. VOLKMER. All right. And what was the problem with Martin Marietta?

Mr. ROBERTS. There was no problem. We're talking to them. In fact, we have a meeting either later today or tomorrow, continuing discussions.

Mr. VOLKMER. Earlier you had mentioned in your testimony—and I believe also in some of the answers to Mr. Skaggs—that the increased costs at this time over and above what the costs were in the contract with NASA on the shuttle was making it—I got the impression you said prohibitive to even put the satellite up.

Mr. ROBERTS. Yeah. Let me clarify that.

We—As I said, we're in a competitive business. We are not regulated. We don't get our return based on what our costs are. We compete in the marketplace with other commercial vendors of telecommunication services, satellite, fiber optic, microwave, whatever technology there is. And we are faced with tough competition and every cost element that we have we pay very close attention to, which probably is why we are one of the vendors that has been able to turn a profit in this business. And when you take a launch or any other cost element that's that major and essentially more than double that cost, the business plan is then put in jeopardy and, frankly, the margins are gone, and we are in that kind of a business.

Mr. VOLKMER. Well, I'm reaching a conclusion that if what you're telling me is all accurate, and that the earliest you can get on an Ariane probably is '91, but then your satellite's life span is half over, if the cost of going with any other launch is prohibitive, you're not going to put the satellite up anyway.

Mr. ROBERTS. I hope that's not the end conclusion, but we're working the problem and we're working it hard. We're working it every day with all the ELV people.

I might clarify that the life of the satellite won't be cut in half. It's just four years later than we wanted it up there. The four years will be tacked on to the end of the life. But we've got a problem with our business between the time we thought we were going to launch and the time we can launch because we can't get any revenue through it, plus the technological advances that are made by other satellite owners and our competitors in the marketplace.

Mr. VOLKMER. All right.

Mr. Crockett, if it's not proprietary, when did you contract with Martin Marietta for the two Titan launches in '88-90, approximately? It doesn't have to be exact.

Mr. CROCKETT. When?

Mr. VOLKMER. Yes.

Mr. CROCKETT. Within the last year.

Mr. VOLKMER. Was it in 1987?

Mr. CROCKETT. Yes.

Mr. VOLKMER. All right. And can you tell us if you have a set date in '88 yet for launch?

Mr. CROCKETT. There are some tentative dates. One is towards the end of the year and one in the following year. But those are subject to a number of normal business considerations as to when the satellites will be ready and so on.

Mr. VOLKMER. All right.

Mr. Roberts, to get back to you, if you are able to enter into a contract with another launch group, whether it's Martin Marietta or China or anybody else, when's the earliest that you think you would be able to get a launch date?

Mr. ROBERTS. I'd like to say first of all that we're not going to entertain any launch other than a U.S. launch.

Mr. VOLKMER. All right.

Mr. ROBERTS. With the possible exception of the French.

Mr. VOLKMER. With the possible exception of the—

Mr. ROBERTS. Of the Ariane.

Mr. VOLKMER. Ariane. All right.

Mr. ROBERTS. And I believe that the way we see the industry right now, that '89, late '89 might be the earliest possible.

Mr. VOLKMER. Eighty-nine.

Mr. ROBERTS. That's really being optimistic.

Mr. VOLKMER. I just don't know. Do any of you know how many satellites we have out there that are in a position of Contel and INTELSAT, that had commitments from NASA to go on a shuttle and got bumped off? Do we know how many we have?

Mr. ROBERTS. I believe—excuse me. I believe that count is six or maybe seven.

Mr. VOLKMER. Pardon?

Mr. ROBERTS. Six or maybe seven, I believe is the—

Mr. VOLKMER. Six or seven is the total of the satellites that have been constructed and would have had a timetable to go when they were bumped off?

Mr. NELSON. I think that answer is about 16.

Mr. VOLKMER. Sixteen?

Mr. NELSON. Under construction, which included foreign.

Mr. ROBERTS. You're probably more accurate. I was looking at satellites that were going to be used for domestic services. If you're talking about all of them, that's probably right.

Mr. VOLKMER. Okay. I'm just trying to make up my mind on whether that section 5 is going to cause us more problems or not, because if you're able to finally reach, Mr. Roberts, an agreement with some launch company for a launch vehicle, and you're able to get one up in '89, that's about the best you're going to be able to do anyway, is it not? Section 5 won't help you any, will it?

Mr. ROBERTS. That would be the best from a timing standpoint that we could do, I believe.

Mr. VOLKMER. That's what I mean. Section 5 isn't really going to help you any.

Mr. ROBERTS. It's—Well, again, I think it would be a signal to the industry that we don't get abandoned.

Mr. VOLKMER. Yes, Mr. Crockett.

Mr. CROCKETT. As I said earlier, I would hope the discussion wouldn't focus totally on section 5. I do have sympathy for Mr. Roberts' point of view. I think when it comes to using launch vehicles, whether they're Titans or Atlas Centaurs or shuttle or Arianespace, keep in mind these launches aren't necessarily fungible. You go and you design a satellite to fit within a certain configuration of launch vehicle. You may be going on a launch vehicle by yourself; you may be going with somebody else; you may have designed it like a pancake so it fits on shuttle. If you're in that situation, you're in desperate shape right now. So I think it's difficult to draw analogies as to the fact that we're going to be able to launch satellites because of certain facts and circumstances that relate to the unique characteristics of our satellites as opposed to Contel ASC's.

Mr. VOLKMER. In other words, you're going to be able to modify your satellite so that they can go up on time?

Mr. CROCKETT. Well, we were just fortunate to have satellites that would fit on a Titan and were able to get a Titan launch, and that's more luck than it is business design.

Mr. VOLKMER. I understand that. I understand that. But I've also come to the conclusion where it really wouldn't perhaps help you but it wouldn't hurt anything, either, section 5. And I am a little bit concerned, and I'm sure that the committee will have to look at the area that you mentioned, Mr. Crockett, and also the others, as far as the liability and the question as to the amount, et cetera, because if the insurance is not available, or at the amount that we specify, or the Secretary specifies, or if the costs are prohibitive, that, too, can delay or remove a launch.

Yes.

Mr. CROCKETT. Yes. There's nothing like competition to force these things to come into line a little bit. For example, when NASA was the only launch vehicle in town a few years ago, they were somewhat difficult to deal with. They had certain terms. They were very uncompromising. Ariane came along and then both Ariane and the shuttle went out and attempted to attract business and both of them got particularly customer-oriented. And now the tide has turned again with NASA unable to launch. Ariane is more difficult to deal with.

And as an example, when both were in heated competition, Ariane was offering launches with no insurance indemnification requirement. They now have an insurance indemnification stipulation. So I don't mean to sound like, we can't deal with these people, but when and if there is competition, it's a healthy environment and the customer is the beneficiary.

Mr. VOLKMER. Thank you.

Thank you, Mr. Chairman.

Mr. NELSON. Mrs. Morella.

Mrs. MORELLA. Thank you.

First of all, I want to welcome the satellite industry panel. I want to particularly call attention to the fact that Mr. Roberts, Contel ASC, is located in the heart of my congressional district, in Rockville, Maryland. I want everybody to know that we're very much involved technologically, and Mr. Crockett is involved with

COMSAT that is also involved in my congressional district, and so I thank all of you.

I was told to keep my questions brief, and I certainly will.

One of the ones that I did want to address to you is that the bill before you—and we're all cosponsors—requires the launch provider to obtain, on behalf of the customers and him or herself and the contractors of both, insurance available to cover the so-called maximum probable loss, and to the third parties that would be associated with activities under the launch license. But the maximum is 500 million dollars. I wondered what your reaction was to that, if you have not already commented on something like that.

Is that okay? Is that reasonable? Is it—

Mr. CROCKETT. We think it's way too high because many foreign launch providers are considerably less than that. One in particular is at 70 million dollars right now, and that's subject to negotiation in general. So we think the 500 million dollars imposes an insurance requirement on the launcher and the people that are going to ultimately own the satellites and probably disadvantages us between 300 to 500,000 dollars per launch.

Mrs. MORELLA. So you would suggest another figure?

Mr. CROCKETT. We would hope it would be flexible, but that it should be considerably lower, substantially lower than 500 million.

Mrs. MORELLA. Anyone else want to comment? You all tend to agree with him as the spokesperson on that one.

I also wondered, have any of you met with any members of the administration to discuss space policies? Have you not been invited? Everybody's so quiet.

Mr. FREY. I have not been invited to and have not had an opportunity to discuss that—and I can't speak for other members of our company. But I'm not aware of any conversations that have occurred as of yet.

Mrs. MORELLA. I guess that's throughout the panel, none of you have. I think it's significant, which is why I asked.

Mr. ROBERTS. We've been spending obviously a lot of time with NASA on this issue, and we have a government office in D.C. that has continuing relationships with people in the administration, but I'm not sure that they've discussed this particular issue.

Mrs. MORELLA. Would you welcome a discussion of that nature?

Mr. HOLLIS. Ford Aerospace would certainly welcome the opportunity, yes.

Mrs. MORELLA. All right, fine. Thank you.

Thank you, Mr. Chairman.

Mr. NELSON. Thank you for your penetrating question. You obviously exposed something that's rather revealing.

Let me just say that I agree that we don't want to get bogged down in section 5. There's the overall import of the legislation.

Let me just mention a couple of other things as we wrap this up.

The part in section 5 that says the Secretary of Transportation shall, wherever practicable, take steps to ensure that eligible satellites receive priority status for launch from United States launch sites, that, according to the drafters, is not an attempt to breach existing contracts for other contracts for launch. This is just simply an attempt to make up and to make right when all of these people

were knocked off the shuttle. But we can continue to discuss and massage that particular part.

Let me just round out this panel by asking you: In view of some of the witnesses yesterday differing on whether the addition of Government support through indemnification on third party protection, where they differed on, in fact, would it enhance the competitiveness of U.S. launch companies, I would like to have your quick views on that, please.

Let's just go down the panel. Mr. Roberts?

Mr. ROBERTS. In my opinion, it would enhance the competitiveness. In my opinion—

Mr. NELSON. I'm sorry. What?

Mr. ROBERTS. In my opinion, it would enhance competitiveness.

Mr. NELSON. Mr. Crockett.

Mr. CROCKETT. I'll even go a little stronger on that. If you don't do it, you won't be competitive, period.

Mr. HOLLIS. I certainly agree with Mr. Crockett. I think it's an absolute necessity in order for them to hope to begin to compete with some of the companies who have no—they require no third party liability insurance, or else have a much lower cap.

Mr. FREY. And we agree. We think it's an important aspect to the bill, particularly with respect to the subsidized foreign carriers.

Mr. NELSON. And you're saying that in that, if you don't have an indemnification over available insurance, that the cost of the insurance on third party liability just gets so prohibitive—

Mr. FREY. It's the cost and it's the uncertainty of future availability and costs. Any claim in that marketplace we think would essentially make the insurance unavailable, and certainly at very unpredictable costs.

Mr. NELSON. Okay. Gentlemen, we appreciate it.

Yes, Mr. Hollis.

Mr. HOLLIS. I would just like to add to the statement about the lack of being—the lack of assurance that you're going to be able to get that insurance. If you have a naysayer that wishes to veto or kill a program, all he has to say "but what if it's not available?" And then we're hung out. That aspect of being able to close that argument is a very powerful one.

Mr. NELSON. The certainty—

Mr. HOLLIS. Yes, sir.

Mr. NELSON. —of being able to offer a price and be able to stick to that price by virtue of one of the uncertainties cleaned up. Okay.

Well, we appreciate your testimony. It has been most enlightening. We have consistently had excellent testimony from you all as part of this industry and we appreciate it very much. Thank you for your participation. At least the legislative branch will continue to consult your industry.

All right. Let's have Panel II and Panel III, if they will come up. We're going to have the large and the small launchers, so we're talking about McDonnell, Martin, General Dynamics, Space Services and E'Prime, if all five of you would please come up to the table.

Good morning, gentlemen. We're delighted to have you. We're looking forward to your part of the testimony, and we thank you for your consultation over the course of time as we have had hear-

ings on this in the past, publicly as well as privately. So we want to get you here today as we start to fine-tune this legislation.

So why don't we just start in the order on the agenda, and Mr. Yardley, we'll start with you.

STATEMENTS OF JOHN F. YARDLEY, PRESIDENT, MCDONNELL DOUGLAS ASTRONAUTICS COMPANY; RICHARD BRACKEEN, PRESIDENT, MARTIN MARIETTA COMMERCIAL TITAN, INC.; DENNIS R. DUNBAR, PROGRAM DIRECTOR OF ATLAS CENTAUR, GENERAL DYNAMICS; WALLACE H. BOGGS, VICE-PRESIDENT ENGINEERING, E'PRIME AEROSPACE CORPORATION; DONALD K. SLAYTON, PRESIDENT, SPACE SERVICES INC. OF AMERICA

Mr. YARDLEY. Thank you, Mr. Chairman.

If it's all right with you, I would like to have my statement put in the record and abbreviate—I know you're short of time and a lot of the points have been already made, so I'll go through this fairly quickly.

We're certainly happy to be here today, and as I told you prior to the hearings, I think the efforts that your committee has put on the H.R. 3765 are outstanding. We were talking to you last September and you listened, and that isn't always the case in Congress, although. It's always the case with your committee. So we're very happy with it, obviously. As has been mentioned before, there are some details that need to be worked more and so on.

But we think the liability issue coverage, by and large, is very good. We can argue about whether the 500 million dollars is too high or too low. I think 500 million dollars is a reasonable number because that's what we used for years on the shuttle. Now, it turned out that a year or so ago we couldn't get that much money for the Palapa and went down to 300 million dollars. So it's got to be somewhat flexible. But I don't see any big problem on that.

We think that, as we mentioned last September, that if our industry is to survive in the face of foreign competition, we must have a long-term solution to this problem, and I think you're on the right track. This is a reasonable approach to risk allocation and we think we can probably cover up to 500 million dollars most of the time in the insurance marketplace.

Now, this doesn't solve all our problems. As we mentioned—most of us mentioned—last September, we still face this problem of foreign competition that is subsidized. The Russians and the Chinese, of course, are getting more active. We have heard—and we can't verify—that the Russians have offered one foreign nation to launch them for free, to get them involved, and it's hard for us to figure any subsidy program that can match that. So I don't know how we're going to solve that problem. I think that we're going to keep trying, and we may not be able to. But we know that you'll be helping us in any way that is reasonable.

Now, we have noted with interest that the President has a new policy on space, and we think it's probably more favorable, the problems we've been discussing here, than the previous NNSD-94. Incidentally, we were asked, as some of the people that were not asked the last time, we did have an opportunity to appear before the Economic Council on some of these issues. We didn't have an

opportunity to see their whole bill or to critique it after they got a draft or anything like that, but we did get, I'd say, one-and-one-half cents in, maybe not a full two cents.

However, we have not been able to find the policy, the actual policy yet. We've been using the press releases and we have been told it's classified and to—mañana and that sort of thing—but we hope to get a policy soon so we can see where we really stand.

Now, about the business of the eligible satellites, I just might make a comment or two. All of these—I can understand these people's concerns, but everybody loses something because there's no way to recover from a Challenger launch. They had to lose two years, even if we kept launching on the shuttle. Now, the Government contract is generally set up in a best efforts manner, and so if they sign those contracts, they knew what they were signing.

Now, they might say well, look, you darned old launch vehicle guy, you don't have any sympathy for us. The fact of the matter is, when the President threw commercial communications satellites off the shuttle, he threw our payload assist modules off, too, McDonnell Douglas, so we probably lost as much as anybody and we're not griping.

I think, with that, I'll just say—I'll conclude and say that we believe, if we can figure out a way to attack this subsidy, that we can retain our position over the long haul as the world leader in commercial launch services. I think we have a great stable of vehicles now and I don't think anybody can match us, but we can't give them away. We think that we need to have a partnership between Government-industry to do this, and we are getting there. This committee has been very helpful. We're not seeking a free ride, but an equitable distribution of the risks so that we will be better able to compete in the long run. We would like to help you in any way that you think we can, to assist you in getting it passed.

Thank you.

[The prepared statement of Mr. Yardley follows:]

February 17, 1988

TESTIMONY OF
JOHN F. YARDLEY
PRESIDENT
MCDONNELL DOUGLAS ASTRONAUTICS COMPANY

TO

SUBCOMMITTEE ON SPACE, SCIENCE, AND APPLICATIONS
COMMITTEE ON SPACE, SCIENCE, AND TECHNOLOGY
UNITED STATES HOUSE OF REPRESENTATIVES

JFY TESTIMONY
COMMERCIAL SPACE LAUNCH ACT AMENDMENTS

Thank you Mr. Chairman and distinguished members of the Subcommittee. I am pleased to have an opportunity to be here today to represent McDonnell Douglas and present my views on H.R. 3765, the Commercial Space Launch Act Amendments. McDonnell Douglas is strongly in favor of this shared risk approach and sees this legislation as a positive step toward eliminating some of the obstacles that face our industry and could inhibit the United States from realizing its goal of a viable, competitive commercial launch industry.

We currently have four firm contracts to launch five spacecraft in 1989 and 1990. Additionally, we have five firm reservations to launch payloads through 1991. Unfortunately, a few near-term contracts and reservations do not constitute a mature and viable commercial launch industry. It should be noted that in order to obtain these commercial contracts, McDonnell Douglas has had to address the liability issues associated with commercial launch of an expendable launch vehicle. Our acceptance of the total risk and our offer of indemnification must be considered a short-term business decision that we have made in an effort to take the first step toward establishing a U.S. commercial launch industry. Accordingly, I believe that if our industry is to survive over time in the face of foreign competition, a long-term solution must be found. We are pleased that this subcommittee is moving forward to help resolve the critical issues that face us.

This bill is important to us because, in essence, H.R. 3765 provides a reasonable approach to risk allocation in the event that damages resulting from a commercial launch accident exceed the financial protection reasonably available from the insurance marketplace. To be more specific, under this legislation, launch companies would assume liability for the "maximum probable loss" up to \$500 million and the U.S. Government would assume the very remote risk of claims in excess of that amount. This shared risk approach is similar to that provided by the Government when NASA furnished commercial launch services. We consider this provision to be essential in that it will then be unnecessary for commercial launch firms to put their entire company on the line, or to "bet their company", as they say, each time they participate in a launch activity.

Without some relief, such as the risk allocation provisions of H.R. 3765, our fledgling U.S. commercial launch industry would have to continue to assume virtually all significant risks of loss or injury associated with a launch. This burden quite likely would force us to consider carefully the practicality of continuing in the commercial launch business. Moreover, costs of insurance passed on to the customer would price us out of the competitive market in relation to our foreign competition.

If we as a nation are to remain in the forefront of space endeavor and to maintain our ability to compete in the world market, we must pull together to eliminate the unnecessary impediments to establishment of a strong, domestic commercial launch industry. Only then can U.S. industry compete effectively with international competitors that receive substantial subsidies from their governments in providing liability protection for their customers at little or no costs.

As a matter of national pride, foreign governments are determined to have successful space launch programs and are taking steps to assure success. Both Europe and the Soviet Union are engaging in aggressive marketing to secure international customers for their respective launch systems. Faced with the requirement to compete in an international market where our competitors receive substantial direct and indirect support from their governments, U.S. commercial launch contractors, such as McDonnell Douglas, may be forced out of the commercial space transportation market.

From a competitive point of view, the commercial launch industry will still be faced with a severe problem even if H.R. 3765 is passed. Because of governmental support, foreign competitors are now able to offer a price schedule that could undermine any efforts by U.S. firms to gain a creditable world market share. Therefore, we heartily endorse the provisions of Section 8 of H.R. 3765 which call for a dialogue with appropriate foreign government representatives to seek the development of guidelines for access to launch services by satellite builders and users in a manner that assures the conduct of reasonable and fair international competition in commercial space activities. Such a dialogue could go a long way toward preventing the eventual loss of our domestic launch capability. Without a domestic launch industry, the United States could see its lead in space transportation and its access to space severely eroded by the early or mid 1990's.

We have noted with interest the Administration's new policy signed by the President on January 5, 1988 and announced last week. The policy seems to be complementary to the objectives of H.R. 3765 and is designed to encourage private industry to set up a commercial launch capability that can compete internationally with those of Europe, the Soviet Union and China.

According to the announced policy, the Administration is planning to take administrative steps to address the insurance concerns of the U.S. commercial launch industry. Those steps include proposing to Congress that a \$200,000 limit be placed on third party noneconomic damage awards. Additionally, the Administration wants to limit the liability of commercial launch operators for damage to Government property to the level of insurance required by the Department of Transportation.

We are interested in seeing how the Administration's new policy will be implemented and are waiting to hear from the Air Force on whether there will be any substantive changes to the USAF Model ELV Commercialization Agreement as a result of the Administration's new initiatives. We are hopeful that the change in policy will indeed be a significant step toward resolving some of the issues we are addressing today.

In conclusion, I believe that the U.S. can retain its position over the long haul as the world leader in commercial launch services. However, this cannot be done unless we forge a partnership between Government and industry and remove the severe disadvantage launch service contractors face with heavily subsidized foreign competition. Industry is not seeking a free ride, but an equitable distribution of the risks so that we will be better able to compete in the long run. H.R. 3765 does that and McDonnell Douglas will assist in any way it can to ensure passage of this vital legislation.

Mr. NELSON. Thank you, Mr. Yardley.
Mr. Brackeen.

Mr. BRACKEEN. Thank you, Mr. Chairman. I'm also quite pleased to be here today and to tell you how appreciative we are of your committee's efforts. Your action—and I underline the word action—sends a clear signal, I think, that America intends now to move forward with our space launch recovery program.

Like Mr. Yardley, I'd like to just extract some comments from my written testimony. We provided that to you for the record. I will kind of give you a status report. Since I testified before you last September, we have been working hard to firmly establish Martin Marietta's commercial launch business. As has been noted this morning, we recently entered into a long-term agreement—and I stress the words long term, for the stability that that infers—with the General Electric Corporation under which we're going to supply up to 15 commercial launches to them, resulting now in our plans and contracts to launch a total of 19 satellites on commercial Titans over the next several years.

You may know our first launch, which is going to carry the Japanese JCSAT satellite and the British Skynet satellite, is now planned for the summer of 1989. We committed to building these launch vehicles three years in advance of that date. In addition, as Mr. Crockett mentioned, we have contracts to launch two INTELSAT-6 satellites, one in 1989 and one in 1990.

On the status reporting side of governmental issues, we're very pleased with the progress on several fronts, and we're very encouraged by the strong support of our industry that's been reported in the press releases from the President's recent space policy initiatives. Particularly we're encouraged by the administration's willingness to share the risks for potential liability of commercial launches.

I might also add of very considerable importance to us was the State Department's recent reaffirmation of its policy protecting critical U.S. technology from potential loss through launching U.S. satellites in Russia on the Proton launch vehicle. We believe that the same risk of U.S. technology loss, exacerbated by the Chinese government's vigorous thrust to obtain Western launch contracts at any price, will likely require similar action and support of the commercial launch industry, also.

Turning now to H.R. 3765, I just have to express our appreciation for your resolution, your proposed resolution, to the key remaining problem critical to this new industry. As we all testified last September, the single overriding concern that we must take into account with each new investment decision are these unbounded launch risks, however improbable. I spoke then of a need for a risk-sharing approach in the remote event that damages resulting from a commercial launch accident might exceed insurance coverage reasonably available in the marketplace. I think this need has been fully documented in the excellent testimony by the AIAA yesterday and by others today.

As we all have said, it's clear a strong precedent exists for sharing the space launch risk between the U.S. Government and the private sector, and I won't go into detail. Of course, I'm referring to

the shuttle process and precedent, and we think that is a very appropriate precedent for our industry.

I would point out that in the case of shuttle-launching commercial satellites, no third party claim was ever filed. As I will discuss later the fact that NASA as well as the satellite customer and their subcontractors entered into cross-waivers is very important, and we're going to propose that addition to your bill, also.

In our deliberations—and they were long and thoughtful—in entering this business, we were hopeful that the NASA precedent would be followed in legislation that would equitably allocate these risks. We proceeded to aggressively develop this new business quite honestly on the presumption that the action you're taking today would ensue. And should there be any confusion from earlier testimony, we would certainly have to reassess new expansion continued operation after we satisfy existing contracts should some risk-sharing solution not be found.

As you know, our current agreements with the Air Force requires us to obtain the maximum amount of insurance commercially available at a reasonable price, to be determined by the U.S. Government. To the extent available, this insurance has to cover all third party risks, all the risks of damage to U.S. Government property, all losses resulting from injuries to U.S. employees, regardless of fault. The maximum probable insurance level of 500 million dollars is probably reasonable, although you can argue it should be less. I'd like to differentiate and say the maximum possible loss from an accident, of course, not only far exceeds the amount of insurance reasonably available on a given policy; it also exceeds current worldwide insurance capacity.

I have to stress that the risk of maximum possible loss is very remote, and were it to occur, however, as we have all said, it could be well beyond the resources of any company to handle. And every contract we've signed in anticipation to the action you're proposing to take has increased our cumulative risk.

As has been testified, an additional problem we have and concern to us is that the current situation does put us at a competitive disadvantage internationally. As has been stated repeatedly and in prior testimony, foreign launch programs do receive substantial support from their governments. Arianespace is held harmless by the European Space Agency and the French Government from third party claims exceeding about 70 million dollars, or 400 million French francs. As we understand it, they're indemnified from launch facilities damage at a level far below what might be caused in a probable accident, and as Mr. Yardley testified in the case of the Proton and Long March vehicles, the Soviet and Chinese Governments appear to assume all the risks and can evidently price below their costs if they can give rides away.

And the truth of it is, this support enables our foreign competitors to realize savings which they pass on to their customers in price reductions. Mr. Crockett testified from a half-million up to three-quarters of a million dollars per launch is enough money to make a decision swing from an American launch vehicle of any of these manufacturers to an Ariane.

It's also worth noting that foreign launches occur in a far more favorable commercial risk environment, and that does make each

new decision to build a new launch pad or to expand business easier if it's going to be done in Karu and not at Cape Kennedy.

I'd like to say that the commercial launch industry is, I think, fulfilling a key role in maintaining American space launch recovery and our leadership in space. Our industry is already having a favorable impact on the national economy and the foreign trade deficit. For example, at Martin Marietta, in 1987, we booked contracts worth approximately a third of a billion dollars for commercial launches, all of it from foreign customers. Testimony earlier pointed out the fact that this industry could be expected to contribute nearly a billion dollars in foreign trade, to the balance of payments, and nearly 200 million dollars in taxes—local, Federal and State taxes. So it's an important industry for us all.

We are aware, based on what we've seen, that the President's recently announced space policy initiatives on launch risk liability and risk sharing do differ from the approach you have proposed. I have not seen the details yet. However, since there seems to be an obvious agreement in objective, we are hopeful that an approach acceptable to both branches can be quickly developed. A lengthy delay in resolving this issue is going to have a dampening effect on our industry, and that's the truth.

A few comments on specific sections of your bill. Commenting on section 4, as it now stands we certainly support it. As had been proposed earlier, we would suggest a slight modification, and that would be that the launch company should assume liability for private sector and U.S. Government risks up to the maximum probable loss, as defined by DOT, or the maximum insurance capacity available at that time, whichever is less, because as did occur in the case of shuttle launches at one time, there was not sufficient capacity to acquire 500 million dollars, and that was adjusted down. With that change, we can certainly support what you proposed. We are also strongly in favor of establishing dollar limits and periodic reviews of that required insurance.

As regards to the reciprocal waivers proposed in your bill, we have already adopted those principles and they're in every one of our commercial contracts. We would also support the extension of that reciprocal waiver proposal to require the U.S. Government to participate in such a plan. I think your bill proposes that at the option the Government can participate. But this will have an important effect. It will essentially increase launch insurance capacity by removing the bill's property insurance requirement to the U.S. Government from the same property insurance pool. That satellite replacement insurance pool is very important to our customers if they're going to launch on American launch pads.

To turn briefly to two other sections of the proposed bill, we can't support section 5(b) regarding eligible satellites which, as written, could be interpreted as requiring us to abrogate our existing contracts. Mr. Crockett of COMSAT testified earlier this provision is going to prove terribly disruptive. It creates essentially a potential preemptive right which is going to have an adverse effect on our ability to market launch services to the many customers who do not own eligible satellites, and our international competitors will exploit this when we're in competition against them for a foreign launch. And even if this subsection were amended to

remove the potential of contract abrogation, we can't get enthusiastic about it because it's going to have a dampening effect on marketing for these international programs, most of the commercial launch business.

Second, we also share the Air Force's concern with respect to proposed section 6, which mandates the payment of liquidated damages under certain launch preemption circumstances. This section will have an unintended effect of dramatically reducing the number of launch opportunities the Air Force will allocate to commercial launch operators on their pads. They're going to have to seek to limit their possible exposure to the payment of liquidated damages. If this were to occur, we'd all experience significant delays in honoring our current commitments and, again, unintended, it would have the effect of jeopardizing our competitive posture in this international marketplace.

Mr. Chairman, we have several other comments on H.R. 3765. We have submitted some of them in our current testimony, and we're going to submit some more in writing in the future.

In conclusion, let me again express our appreciation for what you and the committee are doing. This action is very critical to our proceeding in establishing America as the leader in commercial space launch.

Thank you very much.

[The prepared statement of Mr. Brackeen follows:]

STATEMENT OF
RICHARD E. BRACKEEN
PRESIDENT, MARTIN MARIETTA COMMERCIAL TITAN, INC.
BEFORE THE
HOUSE SUBCOMMITTEE ON SPACE SCIENCE AND APPLICATIONS
COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
U.S. HOUSE OF REPRESENTATIVES

February 17, 1988

Mr. Chairman and Members of the Subcommittee, I welcome this opportunity to come before you today. We are deeply appreciative of your continuing support of America's new commercial launch services industry.

Since I testified before you last September, we have been working hard to establish our business. Recently, as you may be aware, we entered into a long-term agreement with the General Electric Corporation under which we will supply up to 15 launches, resulting in plans to launch a total of 19 satellites on commercial Titans over the next several years. We have a number of launch proposals outstanding, and hope to announce additional contracts in 1988.

On the governmental side, we have been pleased with progress on several fronts. We are encouraged by the strong support of our industry contained in the President's recent Space Policy Initiatives, and we are particularly

encouraged by the Administration's willingness to share the risk of damage to government property with the ELV operators. We commend all the concerned departments and agencies for the months of hard work they put into this effort.

DOT's Office of Commercial Space Transportation continues to work with the other interested departments and agencies in a number of areas that should be coming to fruition shortly. For example, we understand that its work on launch risk assessment will be available within the next month. This timely product should be helpful as we move to fine tune your legislative approach to risk sharing.

Commerce continued to lead informal trade talks with the European Space Agency designed to establish a fair and equitable international competitive environment. In another arena, the Air Force and industry continue to improve and refine the government range use agreements.

Of considerable importance to us was the State Department's recent reaffirmation of its policy of protecting critical U.S. Technology from potential loss through the launch of U.S. satellites on the Proton launch vehicle. We believe that the same risk of U.S. technology loss, exacerbated by the Chinese Government's thrust to obtain Western launch contracts at any price, will require similar action in support of the U.S. commercial space industry.

Turning now to H.R. 3765, I want to express our deep appreciation of your proposed resolution of the key remaining problem critical to the future of the new U.S. commercial launch services industry. As I testified last September, our single overriding concern is our exposure to undefined and unbounded space launch risks, however improbable. I spoke then of the need for a risk-sharing approach between the ELV companies and the U.S. Government in the remote event that damages resulting from a commercial launch accident exceed the insurance coverage reasonably available in the marketplace. This need has been fully documented in the excellent testimony given yesterday by the AIAA.

A strong precedent exists for the sharing of space launch risks between the U.S. Government and the private sector. Prior to the establishment of the commercial launch industry in 1986, NASA sold launch services to commercial and foreign customers. NASA was authorized to assume the risk of third party claims but required its customers to share the risk by buying \$500 million of insurance, an amount later reduced to reflect reduced market capacity. In other words, commercial launch customers assumed responsibility for those losses of third parties which they were able to cover with insurance. The U.S. Government assumed the remote risk of claims beyond this level. In fact, no third party claim was ever filed. In addition, NASA entered into liability cross-waivers with both customers and contractors, under which each party agreed to be responsible for damages to its own property, regardless of fault, and not to sue the other parties for losses incurred as a result of injury or death of its own employees, also regardless of fault.

In our decision to enter this new business, we were hopeful that the NASA precedent would be followed in legislation that would equitably allocate risks between the new commercial launch services industry and the U.S. Government and have proceeded aggressively to develop our business on this basis. If such legislation is not enacted, we may be forced to reassess our decision to expand our business in this market.

As you know, our current agreement with the Air Force requires us to obtain the maximum amount of insurance commercially available at a reasonable price, as determined by the U.S. Government. To the extent available, this insurance must cover all third party risks, all the risk of damage to U.S. Government property, and all losses resulting from injuries to U.S. employees, regardless of fault. However, the "maximum possible loss" from a space launch accident not only far exceeds the amount of insurance reasonably available, but it also exceeds worldwide insurance capacity. This excess of possible losses above the amount of reasonably available insurance would be allocated in accordance with general principles of tort and contract law, which subject us to unbounded risks.

For example, the current capacity of the insurance market to provide for third party personal injury and property damage insurance is between \$300 and \$500 million. The "maximum possible loss" that might occur to third parties as the result of a launch accident is well above that amount. In the case of post-ignition damage to U.S. Government property, the situation is worse since no identified market capacity for this risk exists today. Yet the "maximum possible loss" that we could incur is very large. In

addition, these risks aggregate with the satellite launch risk insurance requirements, thereby further reducing the already inadequate insurance capacity currently available to cover our customers' loss of their payloads.

I must stress that the risk of "maximum possible loss" is very remote. Were it to occur, however, it could be well beyond the resources of any company to handle. Each contract that we sign in anticipation of your favorable action in this area increases our cumulative risk.

Of additional concern to us is the fact that the current situation puts us at a competitive disadvantage internationally. Foreign launch programs receive substantial support from their governments. Arianespace is held harmless by ESA and the French Government from third party claims above 400 million French francs (approximately \$70 million), and, as we understand it, from damage to launch facilities above a level that is significantly less than even the "maximum probable loss". In the case of the Proton and the Long March vehicles, the Soviet and Chinese governments appear to assume all risks and can evidently price below their costs. This support enables our foreign competitors to realize savings in insurance costs that they can pass on to their customers, thereby reducing their prices. They also enjoy a more favorable commercial risk environment that facilitates each new investment decision. Our industry needs risk-sharing legislation to enable us to compete more effectively in the international marketplace.

We believe that a strong commercial launch industry is a key element in maintaining American leadership in space, and is a critical element of our

national space transportation recovery program. Our industry is already having a favorable impact on the national economy and the foreign trade deficit. For example, in 1987 Martin Marietta won contracts worth approximately \$330 million dollars for commercial launch services, all of it from foreign customers, or international consortia. According to recent studies, our industry expects to contribute up to \$800 million yearly to the U.S. balance of payments, and up to \$175 million in direct Federal, state, and local tax revenues. In addition, the commercial launch industry will create or maintain about 8,000 direct jobs in the U.S.

We are aware that the President's recently announced Space Policy Initiatives on launch risk liability differ from the approach being taken in your bill. However, since there is an obvious agreement on the need for action in this area, we hope that an approach acceptable to both branches of the U.S. Government can be developed. A lengthy delay in resolving this critical issue could have a chilling effect on America's growing commercial space industry. We will work closely with you and Administration officials in this effort.

Commenting specifically on Section 4 of your proposed bill as it now stands, we support the equitable allocation of third party risks that it contains. However, we would propose that launch companies assume liability for both private sector and U.S. Government risks up to the "maximum probable loss," as defined by DOT, or the maximum insurance capacity available at reasonable cost, whichever is less. We are concerned that, as happened

earlier, the reasonably available insurance capacity might fall short of the "maximum probable loss," and that launch companies would be left with an uninsurable risk. We also support the establishment and periodic review of appropriate dollar ceilings, such as those contained in the proposed bill.

We also support the assumption by the U.S. Government of the uninsurable elements of third party space launch risks, that is, claims that exceed the "maximum probable loss" or reasonably available insurance, whichever is less.

As regards the reciprocal waivers proposed in your bill, we have already adopted these principles in our commercial contracts. We support the extension of this proposal to require the U.S. Government to participate in such a plan, following the precedent established by NASA for its commercial launches. This will have an important effect. It will increase launch insurance capacity by eliminating the bill's property insurance requirement, and by removing these risks from the already inadequate space launch insurance pool available to our customers for the loss of their payloads.

I would like to turn briefly to two other sections of the proposed bill. First, we oppose proposed Section 5(b) regarding "eligible satellites" which, as written, might be interpreted as requiring us to abrogate existing contracts. This subsection also creates a potential preemptive right which will have an adverse effect on our ability to market launch services to the many customers which may not own "eligible satellites." Even if this subsection were amended to make it clear that contract abrogation was not

intended, we would still oppose it. We believe that it would then offer nothing substantive to the owners of "eligible satellites," but would continue to have a dampening effect on our marketing efforts.

Second, we share the Air Force's concern with respect to proposed Section 6 which mandates the payment of liquidated damages under certain launch preemption circumstances. We believe that this section will have the unintended effect of dramatically reducing the number of launch opportunities allocated to industry as the Air Force would seek to limit its possible exposure for the payment of liquidated damages. Should this occur, our company might experience significant delays in honoring our current commitments. Certainly, American competitive posture in the international marketplace would be jeopardized.

We have some additional comments on H.R. 3765, some substantive and some technical, which we would like to submit in writing to you and your staff for your consideration as you move forward with the legislation.

In conclusion, I would like once again to express our appreciation for the opportunity to appear before you today to discuss some of the important issues covered in the proposed bill. I will be happy to answer any questions.

RICHARD E. BRACKEEN**President**

Martin Marietta Commercial Titan, Inc.

Joined Corporation in 1967

Appointed to present position in 1987

Richard E. Brackeen is president of Martin Marietta Commercial Titan, Inc., formed in April 1987 to commercially market the Titan space launch vehicle.

Brackeen's organization focuses on commercial sales of a modified version of the highly successful Air Force Titan III space launch vehicle. His responsibilities include marketing, contracting, and launching commercial payloads on the Commercial Titan.

Prior to taking his current position, Brackeen was vice president of the Space Launch Systems Division at Martin Marietta Denver Aerospace, which became Martin Marietta Astronautics Group on July 1, 1987. The Astronautics Group includes Martin Marietta Commercial Titan, Inc. and three other companies.

Brackeen joined Martin Marietta in 1967 as a development program manager in the firm's Orlando operation and moved to Denver Aerospace in 1968. In 1969, he became project engineer for flight technology on the Space Shuttle Program.

From 1972 to mid 1974, as director for both the Shuttle booster and X-24B programs, his responsibilities included development of the Shuttle solid rocket booster parachute recovery system and management of the rocket-powered X-24B flight research vehicle.

Brackeen also has served as director of business development for command and defense systems in Denver, and as director, advanced programs, at the company's Aerospace Headquarters in Bethesda, Maryland. Subsequently, Brackeen was executive director, and then president, of Martin Marietta International.

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From 1981 to 1982, Brackeen was vice president of strategic planning and development at Aerospace Headquarters, with responsibility for strategic planning, acquisitions, business development, and international operations. He relocated to Denver in 1982 to become vice president for business development at Denver Aerospace, with responsibility for program development, marketing, and strategic planning.

Brackeen was born January 10, 1939, and grew up in New Mexico. He has an undergraduate degree in engineering from the University of Oklahoma, plus a master's degree in management from the Sloan School of Management, Massachusetts Institute of Technology, which he attended as a Sloan Fellow.

September 1987

Mr. NELSON. Thank you, Mr. Brackeen.

Mr. Dunbar.

Mr. DUNBAR. Mr. Chairman, good morning. On behalf of General Dynamics, I appreciate the opportunity to express our views on the Commercial Space Launch Act of 1987.

My name is Dennis Dunbar. I'm Director of Commercial Launch Services at General Dynamics. Dr. Al Lovelace, General Manager and Corporate Vice President of our Space Systems Division, expresses his regrets at not being able to testify this morning due to circumstances beyond his control.

Mr. Chairman, we commend you and the other members of the committee for your continuing efforts to aid in the development of a viable commercial space transportation industry. Clearly, the committee recognizes as we do, the importance to our country of a strong, diversified and competitive commercial ELV industry. This will serve to provide favorable trade balances, protect jobs and contribute to the preeminence in space of the United States.

General Dynamics is committed to being a leader in this emerging business, and we've made major investments of corporate funds to achieve our goals. Obviously, we have a very strong interest in this pending legislation and in considering the effects it might have on our business.

The sponsors of H.R. 3765 clearly recognize many of the problems that we face as our industry develops. As Dr. Lovelace testified in September before this committee, a prime concern has been the unbounded liability that we face today. This bill, which places a reasonable limitation on liability on the commercial ELV by the Government, clearly will assist us in containing this risk and remaining competitive in the international area. The one problem we do have is in section 4, which discusses the insurance requirement, is the statement that the Secretary "may" enter into cross-waivers of claims, and we would like to see the verb changed to "shall" and remove the uncertainty that would exist, as was suggested earlier by Mr. Hollis of Ford and Mr. Brackeen.

A second problem recognized by the bill is the importance of continued research in launch vehicle component technology by the Government. Certainly our international competitors enjoy these benefits. Our individual corporations can afford to make modest improvements in our vehicles, but we believe that more fundamental research and technology should be the role of the Government. This is analogous to the work that NASA and its predecessor, NACA, have done and has contributed such a major factor in our preeminence in the aeronautics arena.

We understand and appreciate your desire in this bill to encourage development and expansion of all phases of this fledgling launch services industry, including support operations. However, we have some concerns about certain sections as worded.

Section 3 states that Government launch property or launch services shall not be provided if substantially equivalent property or services are commercially available from a domestic source on reasonable terms and conditions. It's recognized that the Government should not compete with the civilian sector as a general philosophy, but we have several problems with the specific wording in the section.

First, the definition of launch property can be broadly construed as even including the construction phase of the launch vehicle. We already have existing agreements with the Government for use of Government-owned facilities, tooling and other equipment in accordance with the existing Act. Our business planning and our contractual obligations are based on those agreements. The bill should be clarified to exclude areas already covered by existing agreements.

In addition, "services" is a very broad term. The wording is certainly acceptable for something like payload processing facilities, but it might be interpreted, for example, that we have to purchase small quantities of fluids from a remote vendor as opposed to using existing Government storage facilities on site, or hire an outside photographer to take pictures of the launch complex rather than using existing support contractors. We want to be sure that the term "substantially equivalent" is clarified to include such parameters as viability of the supplier and their competitiveness in terms of price, quality, and schedule.

The desire under section 5 to offer certain incentives for the satellite owners who had contracted to fly on the space shuttle is commendable, indeed. However, it appears to us also that one of these incentives will be very difficult to implement. This section states that certain Government agencies will take steps to ensure that the eligible satellites receive priority status for launch from United States launch sites. Each of the ELV providers seated here are busy marketing, competing with one another, and signing firm contracts with satellite owners for specific schedules. A law which requires the schedule displacement of a satellite already under contract, in effect, requires us to abrogate existing contracts, and that might include the payment of delay penalties. In addition, the specter of having a contract launch date subject to an outside force, other than a national emergency, will have a negative effect on the sales of all of us, as mentioned by Mr. Brackeen.

Finally, we would like to comment on section 6, which discusses the preemption of commercial launch date commitments by the Government. The first paragraph states that the Government will not preempt except for imperative national need. This obviously strengthens the market position of our industry.

We appreciate the intent of the second paragraph which requires the Government to pay liquidated damages for preemption for any other reason. But our opinion also is that this could lead to extremely conservative range scheduling by the Government, and that action would have a negative effect on our industry.

In summary, Mr. Chairman, although we have several specific concerns, we heartily applaud the intent of the bill and we commend you and your committee as you seek to further facilitate and promote the establishment of our emerging industry, an industry which must be strong enough to compete against very formidable international competitors.

We look forward to working with the committee to fine-tune this important legislation, and we thank you for this opportunity to testify.

[The prepared statement Mr. Dunbar follows:]

TESTIMONY OF
GENERAL DYNAMICS
SPACE SYSTEMS DIVISION
TO
COMMITTEE ON SPACE, SCIENCE, AND TECHNOLOGY
ON
COMMERCIAL SPACE LAUNCH ACT AMENDMENTS OF 1987 - HR3765
17 FEBRUARY 1988

Mr. Chairman,

General Dynamics appreciates this opportunity to express our opinion on the Commercial Space Launch Act Amendments of 1987.

Dr. Alan Lovelace, General Manager and Corporate Vice President of our Space Systems Division, has asked me to express his regrets at not being able to testify this morning due to circumstances beyond his control.

Mr. Chairman, we commend you and other members of the committee for your continuing efforts to aid in the development of a viable commercial space transportation industry. Clearly the committee recognizes, as we do, the importance to our country of a strong, diversified and competitive commercial ELV industry. This will serve to provide favorable trade balances, protect jobs and contribute to preeminence in space by the United States.

General Dynamics is committed to being a leader in this emerging business and has made major investments of corporate funds to achieve this goal. Obviously we have a very strong interest in pending legislation and in considering the effects thereof.

The sponsors of HR3765 clearly recognize many of the problems we face as our industry develops. As Dr. Lovelace testified last September before this committee, a prime concern has been the unbounded liability that we face under the law today. This bill, which places a reasonable limitation on the liability of the commercial ELV provider by the government, clearly will assist us in containing the risk of this business and in competing in the international arena. The one problem we have in Section 4, which discusses the insurance requirements, is the statement that the Secretary "may" enter into reciprocal waivers of claims. We would like to see the verb changed to "shall" to remove the uncertainty that would exist.

A second problem recognized in the bill is the importance of continued research in launch vehicle components technology by the government. Certainly our international competitors have such assistance. Our individual corporations can afford modest improvements to our vehicles, but we feel more fundamental research and technology should be the role of the government. This is analogous to the work of NASA and its predecessor, NACA, which has been such a major factor in our preeminence in the aeronautics arena.

We understand and appreciate your desire in this bill to encourage the development and expansion of all phases of this fledgling launch services industry including support operations. However, we have concerns about certain sections as worded.

Section 3 states that government launch property or launch services shall not be provided if substantially equivalent property or services are commercially available from a domestic source on reasonable terms and conditions. It is recognized that the government should not compete with the civilian sector as a general philosophy, but we have several problems with the specific wording in this section. First the definition of "launch property" can be broadly construed as even including the construction phase of a launch vehicle. We already have existing agreements with the government for use of certain government-owned facilities, tooling and other equipment in accordance with the existing act. Our business planning and contractual obligations are based on these agreements. The bill should be clarified to exclude areas already covered by existing agreements.

In addition, "services" is a very broad term. The wording is acceptable for something like a payload processing facility, but it might be interpreted, for example, that we have to purchase small quantities of special fluids from a remote vendor rather than from the existing government storage facilities on site, or hire an outside photographer to take pictures at the launch complex rather than use the existing support contractor. We want to be sure that the term "substantially equivalent" is clarified to include such parameters as viability of the supplier and competitiveness in price, quality, and schedule.

The desire under Section 5 to offer certain incentives for those satellite owners who had contracted to fly on the Space Shuttle is commendable. However, it appears to us that one of these incentives will be very difficult to implement. This section states that certain government agencies will take steps to ensure that the eligible satellites receive priority status for launch from United States launch sites. Each of the ELV providers are busy marketing, competing with one another, and signing firm contracts with satellite owners for specific schedules. A law which requires the schedule displacement of a satellite already under contract, in effect, requires us to abrogate an existing contract, including the payment of delay penalties. In addition, the specter of having a contract launch date subject to an outside force, other than a national emergency, will have a negative effect on the sales efforts of all of us.

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We appreciate the intent of the second paragraph which requires that the government pay liquidated damages for preemption for any other reason, but in our opinion this could lead to extremely conservative range scheduling by the government. Such action would also have a negative effect on our industry.

In summary, Mr. Chairman, although we have several specific concerns, we heartily applaud the intent of the bill as you and your committee seek to further facilitate and promote the establishment of our emerging industry, which must be strong enough to compete against formidable international competitors.

I will be pleased to answer any questions.

GENERAL DYNAMICS
Space Systems Division

DENNIS R. DUNBAR

Biographical Sketch

Mr. Dunbar joined General Dynamics in 1967 and has 20 years of Aerospace management and engineering experience. For the past four years, he has served as Program Director for the Atlas/Centaur expendable launch vehicle program. In August of 1987, he was appointed Program Director of General Dynamics' newly established Commercial Launch Services organization. In this capacity, he represents General Dynamics, Space Systems Division and acts for the General Manager on all matters pertaining to commercial operations of the Atlas/Centaur Program. He directs all new business activities, marketing, program development, mission management, and business operations for Commercial missions, NASA missions and other government missions procured commercially.

Prior to his Atlas/Centaur assignments he served as Program Director on the Boeing 767 Strut Program, where he represented the Convair Division of General Dynamics in the management of the multi-million dollar 767 strut production contract. He was responsible for administering, directing and controlling all phases of the program, to ensure that task performance was in compliance with technical requirements and quality requirements while meeting cost targets and delivery schedules.

Mr. Dunbar was formerly Manager of Structural Design at Convair Division. In this capacity, he was functionally responsible for over 250 structural design engineers and draftsmen, who developed the structural designs and prepared design drawings for all the Division's products. He was responsible for their technical accomplishments and data, their schedule and cost performance and their technical and professional growth.

Mr. Dunbar, and his wife Trina, live in Encinitas California. He has two sons; Robert, 20, and Mark, 18.

Mr. NELSON. Thank you, Mr. Dunbar.

I might just say that from the drafters' point of view—and we may need to clarify this—that there is no intention under section 3 of any kind of implication of prohibition on the use of Government facilities, that the availability of an alternative in launch facilities, if it were available, could be considered. But in no way is the implication there that the Government facilities would be prohibited. And so if there's any confusion on that point, we want to get that quite clarified. This has come up a couple of times, so I think the record needs to state that. We will, over the course of time, clarify it. I appreciate you bringing it up.

Mr. DUNBAR. I appreciate your clarification.

Mr. NELSON. Mr. Boggs.

Mr. BOGGS. Mr. Chairman, distinguished members of the subcommittee, ladies and gentlemen, it's a pleasure and a privilege to testify before the Space Science and Applications Subcommittee today and to laud your efforts in promoting commercial space launch activities. House Resolution 3765 is definitely useful in clarifying several points of responsibility, defining clear indemnity insurance provisions, and helping to expedite the launch of satellite payloads dislodged from the space shuttle launch manifest by President Reagan's announcement of August 15, 1986.

Our company was not a player in the industry at the time of this dislodgment. In fact, it created a situation that induced us into the commercial launch services business. Our testimony will not add to previous testimony on recovery-related areas.

By the way, it has been brought to my attention that the pages 2 and 3 of my handout of prepared remarks are inadvertently reversed, so when you get to there, bear with me.

E'Prime Aerospace Corporation plans to launch in the next several years three classes of rockets: sounding rockets up to a size capable of placing 250 pound payload up to 250 nautical miles; intermediate boosters capable of placing up of 1,500 pounds in low Earth orbit; and medium lift boosters capable of placing 3,000 to 16,000 pounds in a 160 nautical mile circular orbit. We are a start up enterprise, begun in early 1987, but made up of veterans of NASA, Air Force, and aerospace contractor organizations at the Cape Canaveral launch sites.

As a forerunner in testing the new commercialization licensing and promotion apparatus, we have received generally good cooperation from the Department of Transportation and Department of Defense, but have a few observations to offer here. Similarly, we have suggestions that might remove some impediments and promote some very important objectives in the overall framework of commercial space activities.

In the process of meeting requirements of the Department of Transportation for approving a certain launch, and at the same time meeting requirements of the test range—Eastern Space and Missile or Western Space and Missile Center—we would like to see as much common documentation acceptance as possible to avoid the duplication of effort in arranging some supporting data in different formats. The DOT use of the Military Universal Documentation System would be an example.

Our first launch is somewhat of an anomaly. We conceived a small sounding rocket to test the paperwork flow process of licensing and test range use. We found that a desired October, 1987 launch date was constrained by the length of the licensing cycle but we were able to get an exemption from licensing due to the rocket being small enough to classify as an amateur launch. The rocket will really carry four useful payloads and have a professional launch and recovery when we launch it in the near future. The eagerness of payload investigators to fly even on so small a rocket led us to educational and commercial ties that we will discuss shortly.

The big hitch in our launch plans for this launch now, called LOFT-1, is an insurance question. The Air Force Space Division is requiring \$25 million third party liability for this rocket which travels only five miles and weighs only 80 pounds at lift off. We mention this just for information, not to suggest that it influence any legislation.

A \$2,000 rocket and a \$20,000 rocket payload will cost approximately \$12,000 in range costs and \$25,000 in insurance premiums. The Air Force has been extremely cooperative in cutting down review time on submitted documentation and on scheduling issues, but the contracting framework is unwieldy for so small a rocket and the insurance question needs further attention by our company and the Air Force.

Getting on to the suggestions pertaining to the promotion of commercialization, I will address six areas.

One impediment to a new commercial launcher who wishes to compete for any Government launches is any requirement in the evaluation process that states the ability to launch a satellite "shall have been demonstrated" rather than "shall be confirmed in the proposal". Such a provision is in the Goddard Space Flight Center proposal, synopsis, recently appearing in the Commerce Business Daily. This locks out any new competitors if strictly interpreted and enforced. Attention to this on the Government's part would be appreciated, if the intent is to expand the industrial base and the intent to expand competition is real.

As far as general promotion is concerned, the insurance question must be forcefully examined. There are no pure solutions and few proposed remedies in sight at this time, and, in fact, the problem is expected to become more severe in all facets of the business world. Some type of insurance is required, but what is the basis for establishing what is enough?

Restraining unreasonable awards is another question that probably cannot be dealt with in this type legislation. Let us hope that an equitable formula can be established by the Department of Transportation for the required level.

Insurance costs must be passed on to the customer. In the worst case, this can result in a cost that exceeds the expected revenue to be obtained from the satellite and will force a withdrawal from the market or launch on a foreign booster. At best, it will prove to be adverse to commercial space venture because this cost will not be established until the license is issued. We can't run a commercial operation efficiently, cost efficiently, under these conditions.

As a new commercial endeavor, we hope to get aid by receiving contracts to launch Government-owned payloads. In order to conduct commercial launch operations, we must have cost-effective operating procedures. We, along with the Government, must strive for economy with no significant sacrifice in safety, quality, reliability, and timeliness of service. Unreasonable duplication, useless coordination, and bureaucratic delays must be avoided in launch services. Commercial operations must cost less than Government conducted operations if they are to meet national objectives.

Proper priority in assignment of facilities to a commercial launcher is needed, as well as priority consideration in launch scheduling. Incidentally, we have had some delays establishing access to examine potential launch sites for our later programs because we have no sponsor. We, as a company, plan to explore more deeply some of these procedural difficulties with the Department of Transportation and the Air Force. Priority consideration for launch sites in reasonable condition is extremely important because start-up capital is constrained.

Frankly, new venture business in commercial space needs a little help. In the days of railroad development, the Government gave aid by deeding land for rights-of way. In the early days of airlines, the Government gave aid by granting air mail routes. In addition to fair competition for some Government launches, and some launch service guarantees, it is time to get the tax structure behind commercial payload owners and developers in the way of tax incentives to fly with commercial launchers, particularly new companies.

Finally, the academic research community is particularly distressed by the loss of the space shuttle flight opportunities and the Government should explore cooperative ventures among the various communities in contact with the Department of Education, Department of Commerce and NASA. These ventures might partially or wholly subsidize payloads on low-cost commercial launches as a way of continuing research.

Thank you very much for your opportunity to speak to you, and applaud you again on your fine efforts, Mr. Chairman.

[The prepared statement of Mr. Boggs follows:]



E'PRIME AEROSPACE CORPORATION

TESTIMONY OF E'PRIME ASEROSPACE
ON H.R. 3765, "COMMERCIAL SPACE LAUNCH ACT AMENDMENTS OF 1987
WEDNESDAY, FEBRUARY 17, 1988

Wallace H. Boggs
PRESENTOR: WALLACE H. BOGGS
VICE-PRESIDENT ENGINEERING

P.O. Box 792
Titusville, FL 32781 U.S.A.

Phone: 305-269-0900
FAX: 305-269-0959

Mr. Chairman, Distinguished Congressmen, Ladies, and Gentlemen:

It is a pleasure and a privilege to testify before the Space Science and Applications Subcommittee today and to laud your efforts in promoting Commercial Space Launch activities. House Resolution 3765 is definitely useful in clarifying several points of responsibility, defining clear indemnity insurance provisions, and helping to expedite the launch of satellite payloads dislodged from the Space Shuttle Launch Manifest by President Reagan's announcement of August 15, 1986.

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Similarly, we have some suggestions that might remove some impediments and promote some very important objectives in the overall framework of commercial space activities.

In the process of meeting the requirements of Department of Transportation for approving a certain launch and at the same time meeting requirements of the test range (Eastern Space and Missile Center or Western Space and Missile Center), we would like to see as much common documentation acceptance as possible to avoid the duplication of effort in arranging the same supporting data in different formats. DOT use of existing Universal Documentation System format would be an example.

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we were able to get an exemption from licensing due to the rocket being small enough to classify as an amateur launch. The rocket really will carry four useful payloads and have a professional launch and recovery when we launch it in the near future. The eagerness of payload investigators to fly even on so small a rocket led us to educational and commercial ties that we will discuss shortly.

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As far as general promotion is concerned, the insurance question must be forcefully examined. There are no pure solutions and few proposed remedies in sight at this time and in fact, the problem is expected to become more severe in all facets of the business world. Some type insurance is required but what is the basis for establishing what is enough? Restraining unreasonable awards is another question that cannot be dealt with in this type legislation. Let us hope that a equitable formula can be established by the Department of Transportation for the required level. Insurance costs must be passed on to the customer. In the worst case this can result

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in a cost that exceeds the expected revenue to be obtained from the satellite and that will force a withdrawal from the market or launch on a foreign booster. At best it will prove to be adverse to commercial space venture because this cost will not be established until the license is issued. We cannot run commercial operations efficiently under these conditions.

As a new commercial endeavor we hope to get aid by receiving contracts to launch government owned payloads. In order to conduct commercial launch operations, we must have cost effective operating procedures. We, along with the Government must strive for economy with no significant sacrifice in safety, quality, reliability, and timeliness of service. Unreasonable duplication, useless coordination, and bureaucratic delays must be avoided in the launch services. Commercial operations must cost less than Government conducted operations if they are to meet national objectives.

Proper priority in assignment of facilities to a commercial launcher is needed, as well as priority consideration in launch scheduling. Incidentally, we have even had some delays establishing access to examine some potential launch areas because we have no "sponsor". We, as a company plan to explore more deeply some of these procedural difficulties with the Department of Transportation and the Air Force. Priority consideration for launch sites in reasonable condition is extremely important because start-up capital is constrained.

Frankly, new venture business in commercial space needs a little help. In the days of railroad development the Government gave aid by deeding land for the right of ways; in the early days of airlines the Government gave aid by granting air mail routes. In addition to fair competition for some Government launches and some launch service guarantees, it is time to get the tax structure behind commercial payload owners and developers in the way of tax incentives to fly with commercial launchers, particularly new companies.

Finally, the academic research community is particularly distressed by loss of Space Shuttle flight opportunities and the Government should explore cooperative ventures among the various communities in contact with Department of Education, Department of Commerce and NASA. These ventures might partially or wholly subsidize payloads on low cost commercial launches as a way of continuing research.

Mr. NELSON. Thank you, Mr. Boggs.

Mr. Slayton.

Mr. SLAYTON. Thank you, Mr. Chairman. We'll try to give you an entrepreneurial presentation.

We appreciate the opportunity also to visit with the committee today. We have reviewed the bill in a great amount of depth, and as a small start-up commercial company, our concerns are not the same as the big guys to my right. We are doing a mixture of Government and privatized commercial and a lot of the provisions of the bill, therefore, don't apply to us and we aren't going to worry about them.

We do concur in and applaud the findings on the front end. I think those are very well written. Also, the additions made in section 2. The insurance requirements of licensee in section 4 are the primary areas that I think could influence us directly. Having a small, solid launch vehicle with minimum TNT equivalency, when failing either accidentally or through range safety action, should put us on the low end of anybody's insurance requirements chart. Certainly the ceilings established for commercial launch insurance are well in excess of any rational extrapolation of our damage potential—short of us carrying nuclear warheads, which we don't intend to do. Therefore, we are relatively neutral to this section from a company point of view, and we would not fall on our swords if it failed to pass for any reason. But we would not abandon these provisions if our bigger brothers needed our help to remain competitive internationally.

What I would like to do is explore one point here that has been touched on briefly today, and that's the probability of anyone suffering a loss in excess of the proposed insurance ceilings. I think I'm the only non-Government employee that ever provided range safety functions for a launch—and I was about to say I was the only experienced range safety officer in the room, most likely, but I notice on your staff you have Bill Smith, who could have done that same job for us when I did it and the FAA wouldn't let him do it. But I'd like to say a few words on behalf of all range safety, because that's the essence of this whole discussion, the assumption that a range safety officer has failed to do his job.

No launcher will be approved for launch without an approved destruct system and stringent range safety corridors built with adequate margins based on the worst case failure modes of each vehicle. Range safety officers are trained like astronauts. When they hit a predetermined abort limit, they act. There is no time to sit about and mentally debate the wisdom of your decision, because there is no second chance to do it right. In approximately 30 years of space experience, I don't know of any case in the Free World where there's been a liability claim filed due to a launch failure. It's probably not likely to happen in the non-free world, either. This is as strong a statement as you can find on the reliability of range safety systems and the low probability of any insurance claim, let alone one in excess of the proposed limits. Like many others in this room, I'm a strong believer that nothing is impossible. However, I couldn't define a subject I thought was closer to it.

One way you can interpret this, if you want to use actuarial rates based on experience to date, the premiums ought to be zero.

Conversely, the range safety system is a Government system, and if it fails, why isn't the Government liable? Therefore, why is there any requirement for liability insurance at all? Those are two approaches.

Okay. Shifting gears, you asked us to comment on any other areas of business planning, that we might have a concern with, and there is one I would like to comment on. Wally touched on it earlier.

There have been many positive statements made, both in the executive branch and here in the Congress, in support of commercial launch services. We think those are all great. However, we have detected in the implementation of these policies a tendency to write requirements in a manner that encourages business as usual, and in some cases preempt all but one customer or one provider of services. We believe that many innovative ideas will be lost, as well as opportunities to give the taxpayer more for his money, which is what's driving these policies to begin with. Give us a level playing field and everybody will benefit.

Thank you.

[The prepared statement of Mr. Slayton follows:]

Statement of
Donald K. Slayton, President
SPACE SERVICES INC. OF AMERICA

before the

Subcommittee on Space Science and Applications
Committee on Science, Space, and Technology
U. S. House of Representatives

February 17, 1988

Chairman Nelson and members of the committee, Space Services is pleased to have an opportunity to comment on our views regarding the provision of HR 3765, "Commercial Space Launch Act Amendments of 1987." We have reviewed the bill thoroughly and detected no provisions that cause us problems. As a small start-up commercial company our concerns are not the same as the bigger aerospace companies doing a mixture of government and privatized commercial operations. Also many of the bill's provisions do not apply to us.

We concur in and applaud the five findings in Section 1 and also the additions made in Section 2. The Insurance Requirements of Licensee in Section 4 are the primary areas which could influence us directly. Having a small solid launch vehicle with minimal TNT equivalence when failing either accidentally or through range safety action should put us on the low end of anyone's insurance requirements chart. Certainly the ceilings established for commercial insurance are well in excess of any rational extrapolation of our damage potential -- short of carrying nuclear warheads. Therefore, we are relatively neutral to this section from a company point of view, and would not fall on our swords if it failed to pass for some reason. However, we would not abandon support of these provisions if our bigger brother in the industry needed this help to remain competitive internationally.

Let me briefly explore one point which may not have seen a lot of discussion today and that's the probability of anyone suffering a loss in excess of the proposed insurance ceilings. I believe I'm the only non-government employee ever to provide the range safety functions for a launch and probably the only experienced range safety officer in this room. I'd like to say a few words on behalf of all range safety people because the essence of this whole discussion is the assumption that a range safety officer fails to do his job. No launcher will be approved for launch without an approved destruct system and stringent range safety corridors built with adequate margins based on the worst case failure modes of each vehicle. Range safety officers are trained like astronauts. When they hit a predetermined abort limit -- they act. There is no time to sit about mentally debating the wisdom of your decision because there is no second chance to be right. In any approximately 30 years of space experience, I know of no case in the free world where a liability claim

has been filed due to a launch failure. It's not likely to have happened in the non-free world either. This is as strong a statement as you can find on the reliability of range safety systems and the low probability of any insurance claim, let alone one in excess of the proposed limits. Like many others in this room, I am a strong believer that nothing is impossible. However, I couldn't define a subject I thought was closer to it.

Shifting gears, Mr. Chairman, to your kind invitation to advise you of new developments in our business planning, there is one issue of concern. There have been, as evidenced by this bill, many positive statements made and policies established in support of providing commercial services in support of government requirements. However, we have detected in the implementation of these policies a tendency to write requirements in such a manner as to encourage business as usual and in some cases preempt all options but a pre-determined choice. We believe many innovative ideas will be lost as well as opportunities to get the taxpayer more for his money -- which is the driving force behind these policies. Give us a level playing field and everyone will benefit.

Thank you.

Mr. NELSON. Mr. Skaggs.

Mr. SKAGGS. Thank you, Mr. Chairman.

I think the comments that have been made by this panel in particular, about the progress that's been made since our September hearing, serve to credit the Chairman and the leadership in getting this bill put together and moving along.

I wanted to pick up on one comment that Mr. Boggs made in his testimony, about the liability insurance in some instances imposing a cost that can exceed expected revenue, and the whole question of the competitive disadvantage that any of you are put to relative to foreign circumstances, where subsidies are provided.

Can you—and let me direct the question to each of you—flesh out a little bit—numbers have been suggested. I think Mr. Brackeen said anywhere from a half to three-quarters of a million dollars in additional premium for the increment between 70 million and 500 million—I assume that's what you were referring to. I would like to get an idea of how much of your costs insurance premiums represent, what fraction of your anticipated net income from a given launch is represented by this increment between what your foreign competitors have to put up and what you might have to put up if we had a 500 million dollar limit.

Mr. BOGGS. Well, speaking—I was speaking in generalities, and with the 500 million dollar limit. The insurance numbers we've been quoted are about the 500,000—about 500,000 dollars, half a million dollars insurance, and that is not a death-dealing fraction of the cost of launch. So my generalities may be hyperbole when you consider the 500 million dollar limitation.

I think that's workable. I think it is not desirable because of the factors like Deke pointed out, that you're just not going to have that sort of claim happen because of the range safety provisions on expendable launch vehicles and the fact that the range is highly trained and all the hardware is in place to do the destruct function to prevent this from happening.

Mr. SKAGGS. Mr. Brackeen.

Mr. BRACKEEN. Yes. I was just taking a quick look at my last summary of many of the insurance costs to cover this risk, and let me say something we all know, and that is that the insurers won't quote rates for us until the year that we plan to launch, in many cases. And so what we're doing in six or seven categories of insurance we must have, we're basing estimates on what they'll say it would be if we were launching now, but they won't guarantee those rates for 1989 when we begin to launch.

Having said that, yes, the number I gave you—and I'd like to keep it that fuzzy, if you don't mind, between 500,000 and 750,000 dollars per launch, compared to something significantly less, say, for Arianespace, does mean a difference, as Mr. Crockett testified earlier, in a final launch decision. As regards what that is as a fraction of our net income, our profit on these launches, it's a sizeable fraction.

Mr. SKAGGS. I'm sorry?

Mr. BRACKEEN. It's a sizeable fraction.

Mr. SKAGGS. Can you give me just a rough order of magnitude without getting into proprietary information?

Mr. BRACKEEN. Could I give you a written response on that and kind of update the estimates, if you—

Mr. SKAGGS. I appreciate that. Thank you.

Mr. YARDLEY. He said we'd all like to know.

(Laughter.)

Mr. SKAGGS. That's why I understood that there might be some sensitivity to that.

Mr. Yardley, did you wish to comment on that?

Mr. YARDLEY. I'm going to try to find Dick's insurance man, because—(Laughter)—our numbers that we are providing for are considerably higher. Our corporate insurance people have—you know, they work in this all the time for commercial airplanes and this sort of thing, and they've gone across the world trying to dig out of these people what it will be.

Dick's absolutely right. They won't really tell you. We're told 90 days prior to launch, we'll sit down and really negotiate it. So our guys keep jabbing them with questions and come back to us and say well, here's what they said and here's what we think we ought to allow, so that when that time comes, you've negotiated a contract three years prior, you've got enough money in this contract to pay for it. In other words, we add to our profit, if you want, an amount that we think will cover this insurance.

Now, the actual value of the insurance is about equal to what we expect to make. In other words, he won't tell you. I'll tell you. I won't tell you what the amount is, but I'll tell you it's about the same as the earnings we expect to make on the program. So it's really big.

Now, hopefully, we won't have to spend that much, but we're not going to know until we get there.

Mr. SKAGGS. So at least, although it may not be as much as Boggs indicated, the exaggerated circumstance of equaling your revenue, it could certainly equal your profit.

Mr. YARDLEY. Yeah.

Mr. SKAGGS. Mr. Yardley, you indicated in your testimony that you will assist in any way you can to ensure passage of this bill, and you've also indicated, I think, that you have been consulted with by the administration on some of these things. I hope that you might take advantage of your entree there to let them know how important it is that this legislation not become the victim of concerns about limits on what an individual third party claimant might be able to realize in the unlikely event of an accident.

Mr. YARDLEY. When we did appear, we—this bill was not in being at the time we appeared. It was—when was that, John?

Mr. NELSON. Will the gentleman yield?

Mr. SKAGGS. Certainly, Mr. Chairman.

Mr. NELSON. I want to clarify. As it is drafted, the bill does not limit plaintiffs rights.

Mr. SKAGGS. No, I understand that, Mr. Chairman. I was really alluding to Mr. Yardley's conversations with the administration and its proposal.

Mr. NELSON. That's exactly right. That's from the administration's standpoint. It gets all into that question of tort reform.

Mr. YARDLEY. If we do it your way, I don't see that you need that 200 million per person, because you put a level that the insurance

company will cover, and the Government will take anything over that. So everything's covered.

Now, the other still leaves you—are you going to have damages to three people or 300, you know. It's still a toughy and it's difficult to deal with as far as I can see.

Mr. SKAGGS. Thank you, Mr. Chairman.

Mr. NELSON. Let's see. Mr. Walker and Mr. Volkmer.

Mr. WALKER. Thank you, Mr. Chairman.

It has come up a couple of times—it came up with the Air Force yesterday—and I think, Mr. Dunbar, you mentioned the language on page 10 of the bill, that—I think you said could cause the Government not to schedule launches because of the amount of liquidated damages that would have to be paid by the preempting agency. The Air Force mentioned that as a problem yesterday as well.

Is there general consensus that there may be some problem with that particular language? Mr. Yardley?

Mr. YARDLEY. I think it—I think it certainly could be a problem because—

Mr. WALKER. They just wouldn't schedule anything, is that—

Mr. YARDLEY. Well, the scheduling is done by, let's say, a lower level of officer, that wants to make sure he doesn't get caught short of launch spaces.

Now, when we were years ago doing this for the Air Force on the shuttle, they always scheduled a lot of slots early and never used them, and that's the kind of thing that he's really worrying about.

Mr. WALKER. Yeah.

Mr. YARDLEY. If you leave that part out and just say the preemptive right can only be exercised by a very senior official—Now, in the NASA case it was—the Secretary of Defense had to personally say we want to preempt that launch in order to get a launch assigned, reassigned. And so we need—something like that, I think, would be far better.

Mr. WALKER. Mr. Brackeen.

Mr. BRACKEEN. Yes, Mr. Walker. I'd like to say that I really agree with what John said. When we negotiated our range use agreement with the Air Force and signed it last August, say, a lengthy part of that deliberation had to be—had to do with resolving how many flights per year the Air Force would commit us to use Launch Complex 40 for commercial purposes for.

The tendency, as Mr. Yardley has said, is for them to be very, very conservative and to do program planning appropriately to ensure that their national defense and security program is not interrupted, and that they now will be worried about having to pay liquidated damages from funds they don't have is only going to make that worse. It really is going to have a negative effect. And I'd support John's suggestion that the preemption authority reside at a very high level, and I would suggest further that you might want to give them strong language—give them an incentive to provide the maximum access to the facilities so that we can serve these commercial customers.

Mr. WALKER. Is that largely the point you were making, Mr. Dunbar?

Mr. DUNBAR. Yes, it is. In fact, I believe that the intent of the first paragraph of the law would say that the Government will not preempt except for imperative national need, and we certainly on this panel, I believe, recognize the Government's need to have that right. And, in fact, in our case, we have written that provision into our commercial contracts giving the Government that right, when there is a national need, imperative national need, if you want to define that as a national emergency. With that provision, it's not clear that there's a need to worry about paying liquidated damages to the Government. My concern is only, as echoed by Dick, that that might become a reason to become very conservative in the scheduling.

Mr. WALKER. Mr. Boggs, is this something that you've focused on?

Mr. BOGGS. We haven't discussed that very much, sir.

Mr. WALKER. Mr. Slayton?

Mr. SLAYTON. We've haven't had any experience with it in our little company. I might reflect back in the NASA days, though. This concern of getting on ranges is a very real one. I don't view it as much being a conflict with launches because people aren't doing that many launches, but you do get hung up on requirements for RF silence and people are doing pyro checks and those kinds of things on the range that shut you down, and I think when you get more and more people operating on the range, that is going to be a real problem.

Mr. WALKER. I think your point with regard to the range safety officers is an interesting point, about where liability rests. Is there any similarity between what you're saying there in terms of the range safety systems and the air control system that we operate for airlines?

Mr. SLAYTON. Well, not in the expendables because there's nobody in the cockpit. But it might be in the case of the shuttle. But I think in the case of expendables, no, because the guy on the ground is the only one that's really in charge once that thing lifts off. Nobody's in charge except him. He's the only one who can take a positive action, and that's either to let it go or to blow it down.

Mr. WALKER. But my point is one of, in both cases, you have a safety system in place that the Government is responsible for—

Mr. SLAYTON. Yes, sir.

Mr. WALKER [continuing]. And, therefore, the Government would have some liability if that particular system didn't work. And in the course of checking yesterday on a similar question that came up, I was told that, for example, the air traffic control system or the Government can be sued for the failure of an air traffic controller to properly monitor the safety of the system.

Now, what I'm getting at here is, are we in an area where, if the range safety control officer didn't do his job properly, would that be something where the suit would rest against the Government rather than against the commercial provider, and should that be something that is taken into consideration in the development of the legislation?

Mr. SLAYTON. Yes, sir. That's exactly what I'm proposing. The commercial user has absolutely no control over his destiny. Once that thing is that far off the pad, it's in the hands of the Govern-

ment. So that's what I'm saying. You can take the position the Government should therefore be liable.

Mr. WALKER. Mr. Yardley?

Mr. YARDLEY. It may be a moot point. First of all, I'm pretty sure that we, as a furnisher of commercial airplanes, do not have to indemnify flight controllers. On the other hand, in this particular case, if we go your method of 500 million dollars, no matter whose fault it is, and then the Government after that, it really doesn't matter, unless somebody puts some—like the Air Force tends to do—to put some additional provisions if it's a flight controller.

Mr. WALKER. Except that for the smaller provider, that 500 million dollars is a fairly significant sum of money. If, in fact, in your contract—you know, half of your markup is involved as insurance costs—that becomes a major problem on their side that certainly we need to be understanding as we develop legislation here as well.

Mr. YARDLEY. But I would assume that one of the smaller things, as the Chairman said earlier, you can go down from that 500 million, if it's appropriate, they would set some level that it was appropriate. So you wouldn't have these gaps.

Mr. WALKER. Well, is it your impression—I suppose we need to ask the insurance industry this. But is it your impression that by setting the 500 million dollar level, we are, in fact, setting a maximum and that there will be insurance available at costs lower than that, or do we run the risk that, in setting that level, the Congress may define the level at which the insurance people will require for any given launch?

Mr. YARDLEY. In this particular case, as I recall either Deke or Wally were saying, that there was a 25 million dollar requirement by the range for insurance, and that would be your 500 million in that case. They require that much because that's the maximum probable. So why wouldn't the Government cover things above that—

Mr. WALKER. Okay. Thank you, Mr. Chairman.

Mr. YARDLEY [continuing]. In the same spirit?

Mr. NELSON. Mr. Volkmer.

Mr. VOLKMER. Thank you, Mr. Chairman.

I would like to address a little bit different matter. Mr. Yardley, Mr. Brackeen, and Mr. Dunbar, you all testified to the fact that you all—Mr. Dunbar hasn't, but I assume that you have already contracts for launching commercial satellites.

Mr. DUNBAR. Yes, sir, we have.

Mr. VOLKMER. So all three of you have.

You're presenting under negotiations with the Air Force for usage of launch facilities, are you not?

Are you having any—Do you have any yet set for definite date? I'm not asking what date, but any whereby you know you're going to have a launch in October of '88 or February of '89 or anything like that yet?

Mr. YARDLEY. We have launch dates set. I just don't happen to have them now. Do you know our first—March '89 is our first.

Mr. VOLKMER. March '89 you have it. And you have the pad 40?

Mr. YARDLEY. No. We work on pad 17.

Mr. VOLKMER. Seventeen. That's right. You're Delta, right.

Mr. YARDLEY. We think—that's over a year and we have not concluded an agreement with the Air Force yet. Circumstances change as far as we can get the negotiations done. We just got their revision of their contract back last week, after six months, and now we've got the President's policy, it's going to have to be revised again. So—But we're not concerned about it, except in what it says. We've got the time—

Mr. VOLKMER. So you really don't have anything yet concrete from the Air Force?

Mr. Brackeen.

Mr. BRACKEEN. Mr. Volkmer, we also have contracted for fixed launch periods, and essentially our approach is to contract for a launch period that's about 90 days in length, and target a launch date inside that. That final launch date to be set at some period, oh, eight or ten months prior to launch, as suits the delivery schedule and resolution of problems on the satellite side or the facility side. So our first launch is now under contract with JCSAT and the British Ministry of Defence to be available for them beginning 31 July, 1989. And our second launch under contract to INTELSAT is to be available in October, 1989, and depending upon where those final dates are set, we could have a third launch in December of '89 or January of '90. We have a fourth launch under contract for early 1990 with INTELSAT. So we do have contracts for firm launch dates.

On Launch Complex 40, where we'll conduct our launches, there is a great deal of cooperative planning underway with the Air Force to assure our timely occupancy of that pad. They are completing a launch program of the military version of the Titan 3, the 34D, which should be concluded in time for us to occupy the pad and proceed.

Mr. VOLKMER. All right. Mr. Dunbar?

Mr. DUNBAR. Yes, we have launches scheduled in the third and fourth quarter of '89, and then each quarter thereafter.

The point to make on scheduling the range is that that's an Air Force responsibility to schedule the range, and the scheduling of the range occurs much closer to the launch period than we're currently in, so I don't think any of us have had serious discussions with the Air Force on specific dates. So the issue has not really come up as to conflicts.

Mr. VOLKMER. Well, have all of you examined section 5 of this bill?

[Panel nods.]

That's the one that gives priority to launches for those that were bumped off of the shuttle. Does that give you any concern?

Mr. BRACKEEN. I'll be glad to start on that.

Mr. VOLKMER. Yes.

Mr. BRACKEEN. As I testified, that's a very difficult proposition even to make happen, pragmatically. You're talking about the eligible satellites?

Mr. VOLKMER. Yes, yes.

Mr. BRACKEEN. You see, all of the early dates for launches on Titans, and I believe Atlases and Deltas, have been contracted for, and of those 14 or 16 people who might be in the category of eligible satellites, certainly well over half went and took prudent and

reasonable steps when they realized the change in Government policy was imminent or had occurred. Six or seven haven't.

It would be impossible for us to live to the letter, or what we think the letter of the intent of that clause is without abrogating our existing contracts. Further, most of us still have launch dates available in '89 or '90, which is within six or seven months of when anybody could begin commercial launching for those remaining five or six eligible satellites to book if they choose.

As regards seeking to redress interrupted business plans and some kind of a fairness doctrine, that's an admirable objective. Perhaps something is workable in terms of their proportional costs of reimbursing the Government for the range use, when and if they do fly on commercial launchers. That might be an incentive for them to stay on American commercial launchers. But I don't see how we could live with that section.

Mr. VOLKMER. In other words, it could really cause difficulty in the future if you started having to rearrange your schedule, which is already set out for different companies, to take care of the eligible satellites.

Mr. BRACKEEN. Yes, sir. And there's two very important aspects. I don't see how we could rearrange. The people who made plans did so because they also need those resources in space. Secondly, if we conveyed that priority to a time to be chosen by the remaining satellites as we go market, as we are now in Australia, and other nations to get the foreign launches, our competitor, Ariane, would say of course, if you book on an Atlas or a Titan, you could be preempted in your schedule by one of the—

Mr. VOLKMER. Or you could be bumped, right.

Mr. BRACKEEN. Bumped.

Mr. VOLKMER. Thank you, Mr. Chairman.

Mr. NELSON. Thank you, Mr. Volkmer.

Mrs. Morella?

Mrs. MORELLA. Mr. Brackeen, I wanted to pick up on your testimony where you talked about a risk-sharing approach between the ELV companies and the Government, and you go on talking about that whole concept, which sounds like it's a cross-waiver sort of situation.

I wondered what the rationale was for that.

Mr. BRACKEEN. Well, as we have said, as we considered entering the business, this liability issue was among the first that was raised, how would we deal with it. And all of us, quite honestly, turned to the precedent that had been routinely used when the space shuttle was used for commercial launches and other NASA-procured ELVs where used for commercial launches.

While none of us were able to guarantee to our boards that the Government would finally adopt this plan, we all, I think, logically concluded this would be required to put us on an equal international competitive footing and it was likely some sort of risk sharing approach was to be forthcoming.

So if you're asking how did we proceed in absence of it, it's that we anticipated it would happen.

The cross-waivering is an important idea. Of course, from our point of view, with all of our customers and our subcontractors, as Mr. Dunbar said, I think all of us have incorporated those provi-

sions in our commercial contracts and between us and our suppliers. It's quite important that the Government join in that, as it did in the case of NASA. Because if that property insurance is sought on the world marketplace, it's likely that whoever underwrites that will be the same people that underwrite the very important satellite replacement property insurance that customers need, and that will detract from that pool of available capacity. Perhaps it will make it inadequate to cover the number of commercial launches all of our companies would like to do.

Mrs. MORELLA. So you would enhance the availability of the insurance—

Mr. BRACKEEN. Absolutely.

Mrs. MORELLA [continuing]. At that proposition.

Mr. BRACKEEN. Absolutely.

Mrs. MORELLA. And both large and small would agree with that? Do you all agree? Do you think it's a good idea? What it means is that you would simply have insurance for whatever equipment or whatever is yours, is that it?

Mr. BRACKEEN. Each party would be responsible to replace its own loss, recover its own losses.

Mrs. MORELLA. Sort of like having collision insurance, in a way.

Mr. BRACKEEN. No fault.

Mrs. MORELLA. No fault. Right. Good. And you all agree.

Thank you.

Mr. NELSON. Mr. Buechner.

Mr. BUECHNER. Whoever wants to ask—answer this question, I'd like them to do it. Other than the Challenger disaster and the episode with Astronauts Grissom, Chafee and White, has anybody ever had a claim for anything out of the launch industry or the space industry? I mean, do we have anybody that's been struck by a falling satellite or—I'm not talking about workers compensation now, or somebody burned by gas on the ground, by a fluid on the ground or something like that. I'm talking about an explosion that's destroyed commercial or personal property or taken life or created injury. Does anybody know?

Mr. BRACKEEN. I don't know of any.

Mr. YARDLEY. It used to be reported that a cow was killed in Cuba (laughter) by reentering parts or something.

Mr. BUECHNER. I know it was a socialist cow, so (laughter)—so it was probably a good thing for us to do. It was going to feed the Sandanistas; that's what they were going to use it for.

Mr. YARDLEY. I don't believe there's ever been a third party liability claim in terms of launches that I know of. Now, there have been a lot of damages, like pads blow up and vehicles blow up and so on.

Mr. BUECHNER. But those are there on site. I'm talking about people outside of the immediate launch system. I mean, it seems to me that as we get into these questions of indemnification, we're talking about a risk analyses that has to be done. It does sort of come down to how many angels can dance on the head of a pin. And I know the rates go up, and we don't have anybody here from the insurance industry that specifically can give us the justification. I guess you say, well, you know, if that thing would have

landed on New York City in 1981, it would now cost more to rebuild it if it landed in 1988. I imagine that's the way it goes.

But I'm only asking that question because I wanted that for a frame of reference.

Mr. YARDLEY. The only thing I can say is the insurance companies really don't want to go over the ceilings. Now, they know it's a long shot and probably never will happen and never has happened, all that stuff, but they don't want to go from 500 million to one-and-a-half billion, you see. So—

Mr. BUECHNER. Yeah. I'm just looking to see what kind of loss experience there is on it.

The second thing—Mr. Yardley, I'll ask you, since you're on stage here—I know McDonnell Douglas has had considerable problems from the foreign competition, especially Ariel—or Airbus, excuse me. Foreign competition and protection for the U.S. commercial space industry is certainly the thrust of this particular bill.

Do you think that there are things missing from here that ought to be added? You know, while we're addressing this problem, can you think of any other aspects, other than simply the indemnification process, that will enhance America's competitiveness?

Mr. YARDLEY. The main thing, that the bill does make an attempt to deal with a little bit, that I feel is really the important thing, after the indemnification, is the business of how can we, as private industry, compete with foreign governments. We know what the French have been doing for year Ariane-wise with the shuttle; they've been subsidizing. But now we've got the Chinese and the Russians in there with really get-away special prices. And how we're going to be able to live with that, when there are open launch slots—right now we're in sort of a sellers market because of the Challenger and everybody's been down. But the time is coming in several years that that's not going to be the case. And so how we compete with them, I don't know.

Now, what this bill does say, it does encourage a dialogue on this sort of thing. Now, I don't know if there's something more concrete we can do about that or not. It's something that the Commerce Department needs to get in and so on. But I don't know exactly what we'd say in this bill to solve that problem.

Mr. BUECHNER. So you don't think we're going to see campaign ads of launching an American satellite costs 480 billion here but only 212 billion in China? Is that the—

Mr. YARDLEY. I don't know.

Mr. BUECHNER. Oh, those are cars. I get those confused. Okay.

I'm—to any of you, do you think that—the President has made a statement about space and our space industry and pushing it forward, and talking about privatization. Are there any other suggestions that you would make to us as we proceed with this legislation, or as we try to create, at least verbally, a policy that would further enhance it than simply addressing these issues that are in the Space Launch Act?

Mr. Dunbar, Mr. Brackeen, Mr. Boggs, Mr. Slayton?

Mr. DUNBAR. I think all these initiatives are very favorable towards establishing a viable commercial industry, and we certainly applaud all of the initiatives that are being brought forward. I would certainly echo Mr. Yardley's concern about the international

competition. I'm quite concerned about the commercial threat from—

Mr. BUECHNER. Let me just interrupt you for a second.

Now, has the devaluation of the—the slide of the dollar—has that had any noticeable impact on the prices that are being quoted right now for the slots?

Mr. DUNBAR. I would have to think it has had some effect. I wouldn't be in a position to quantify it. We think in terms of perhaps a ten percent effect. But that certainly hasn't stopped our European competitor from being successful in international competitions which we've recently been involved in.

Again, getting back to the point of Mr. Yardley's, I'm quite concerned about the threat of the Chinese, and I think the State Department has seen fit to take certain actions relative to the Russians and the Proton. And I would think perhaps some view towards similar policy might be in order relative to the Chinese.

We're all willing, I think, to play on a level playing field. We're willing to compete when we understand the rules of the road, and that we're competing on fair costing and pricing policies.

Mr. BUECHNER. Mr. Slayton, do you have anything to add? Mr. Boggs?

Mr. Brackeen?

Mr. BRACKEEN. I would simply say I expected to see more dramatic results in the dollar's devaluation vis-a-vis the European currencies in our bids. Some are currently open, which we may, indeed, see some results. But there's been very little to date. Of course, it doesn't affect the Chinese and the Russian prices, as Mr. Yardley has said, because they basically are pricing at whatever it takes.

In regard to your initial question about the recently announced Presidential space policy initiatives, I frankly just had a brief chance to look through them. But there's an encouraging theme in that part of the policy which addresses commercial initiatives, and that is it appears that that's an important aspect of the U.S. Government's future space program and the role the Government seems to be willing to take as an anchor tenant or as a commercial user is quite important.

And I'll tell you that among our commercial bids right now are bids to launch some U.S. Navy satellites, and we expect to have commercial contracts to launch NASA satellites. Now, these contracts won't be exactly like our purely commercial contracts; they'll appropriately have some additional oversight and involvement. But this is a very encouraging trend, quite honestly.

Mr. BUECHNER. Thank you.

Thank you, Mr. Chairman.

Mr. NELSON. Thank you, Mr. Buechner.

Gentlemen, how important is the risk allocation scheme, the one in the bill, to your company's competitiveness? Just a short answer from each of you for the record. Mr. Yardley, just go right on down the line.

Mr. YARDLEY. I think it's very substantial and very important to us.

Mr. BRACKEEN. This is the single, overriding impediment to continue the aggressive expansion that we feel, and it's very important.

Mr. DUNBAR. We believe that the risks are unacceptable to our corporation and we think this bill would go a long ways to setting that straight.

Mr. BOGGS. We think that the provisions of the bill are very important and we support them, and we think it is a real financial concern for our company without them.

Mr. SLAYTON. Yes, like everybody else, we're in support of it. As I indicated earlier, they are not as critical to a small company as they are to a big one, because we don't have as many resources at risk. But obviously, it's to our benefit.

Mr. NELSON. Okay. One final question.

If some facsimile of this legislation does become law, where do you think that the commercial ELVs will be in the next decade, American commercial ELVs?

Mr. YARDLEY. I think they'll largely exist for the use of the Air Force and NASA.

Mr. BRACKEEN. John Yardley has said in this current era it's a sellers' market. We all still have available launch slots. But I do agree that in the mid-90s or so, when perhaps the Japanese competitor comes on stream, and should the Soviets and the Chinese become established, we all won't be at this table. Perhaps some other approach might be here, but it'll be quite difficult.

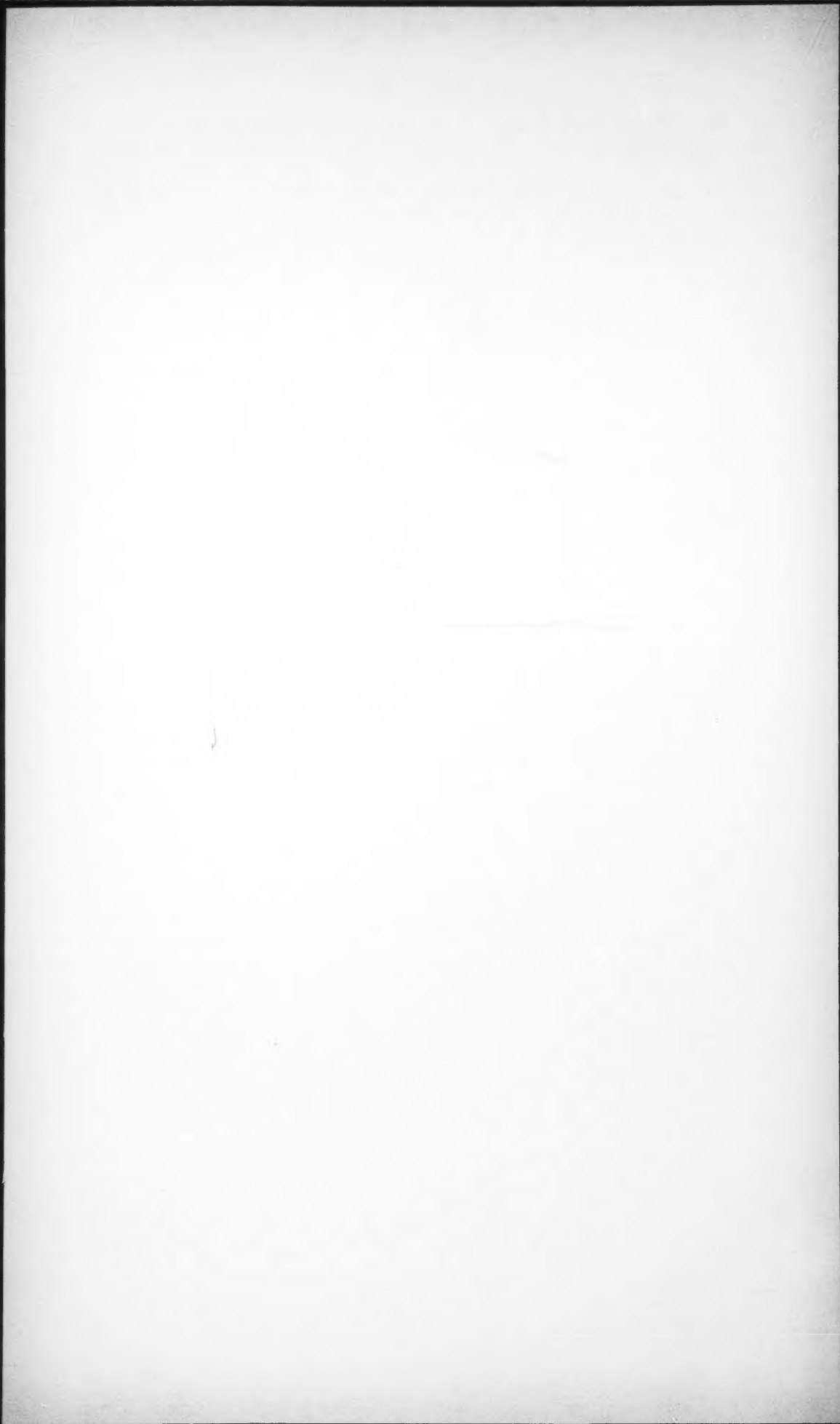
Mr. DUNBAR. I believe the future is very bright, given that we can solve the competitive threat of an uneven playing field from the international competitors.

Mr. BOGGS. I agree with Mr. Yardley, to the extent that the military and NASA role for commercial launch services will be very important. They may well overshadow the satellite and other research applications such as micro-gravity research. I think the necessity of cutting down the cost of the military and NASA activities is going to be a driving force to bring commercialization into full fruition.

Mr. SLAYTON. I would agree with John when you can find a discussion as to what people are making money on today, which is telecommunications. However, we're in a different niche of the market. We forecast that in the different areas that are not even being exploited today, that that's really where the big growth is likely to happen, and we're very optimistic that some of that stuff is going to happen very shortly and some of it will dribble on over to the bigger launch vehicles.

Mr. NELSON. Gentlemen, it's been enlightening. Thank you very much. Have a good day, and the meeting is adjourned.

[Whereupon, at 12:25 a.m., the subcommittee was adjourned.]



APPENDIX 1

I

100TH CONGRESS
1ST SESSION**H. R. 3765**

To facilitate commercial access to space, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

DECEMBER 15, 1987

Mr. NELSON of Florida (for himself, Mr. ROE, Mr. LUJAN, Mr. WALKER, Mr. BROWN of California, Mr. LEWIS of Florida, Mr. VOLKMER, Mr. PACKARD, Mr. HALL of Texas, Mr. HENRY, Mr. MCCURDY, Mr. SLAUGHTER of Virginia, Mr. MINETA, Mrs. MORELLA, Mr. MACKAY, Mr. TORRICELLI, Mr. CHAPMAN, Mr. NOWAK, Mr. PERKINS, Mr. NAGLE, Mr. SKAGGS, and Mr. LAGOMARSINO) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

To facilitate commercial access to space, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE; FINDINGS.**

4 (a) This Act may be cited as the "Commercial Space
5 Launch Act Amendments of 1987".

6 (b) The Congress finds that—

7 (1) a United States space launch industry is an es-
8 sential component of national efforts to assure access
9 to space for Government and commercial users;

1 (2) the Federal Government should encourage, fa-
2 cilitate, and promote the use of the United States
3 space launch industry in order to continue United
4 States aerospace preeminence;

5 (3) the United States space launch industry must
6 be competitive in the international marketplace;

7 (4) Federal Government policies should recognize
8 the responsibility of the United States under interna-
9 tional treaty for activities conducted by United States
10 citizens in space; and

11 (5) the United States must maintain a competitive
12 edge in international commercial space transportation
13 by ensuring continued research in launch vehicle com-
14 ponent technology and development.

15 SEC. 2. RESPONSIBILITIES UNDER COMMERCIAL SPACE
16 LAUNCH ACT.

17 Section 5(a)(1) of the Commercial Space Launch Act
18 (49 U.S.C. App. 2604(a)(1)) is amended to read as follows:

19 “(1) encourage and facilitate commercial space
20 launches by the private sector, consistent with the
21 space policies of the United States as established in
22 public law; and”.

23 SEC. 3. DEFINITION OF DIRECT COSTS.

24 (a) Section 15(b)(1) of the Commercial Space Launch
25 Act (49 U.S.C. App. 2614(b)) is amended by inserting at the

1 end the following: "For purposes of this paragraph, the term
2 'direct costs' means the costs incurred by the United States
3 as a result of an acquisition of launch property or launch
4 services which exceed the costs that would have been in-
5 curred if such acquisition had not occurred."

6 (b) Section 15(a) of the Commercial Space Launch Act
7 (49 U.S.C. App. 2614(a)) is amended by adding at the end
8 the following new sentence: "The Secretary shall not take
9 such actions if substantially equivalent launch property or
10 services are otherwise commercially available from a domes-
11 tic source on reasonable terms and conditions."

12 **SEC. 4. INSURANCE REQUIREMENTS OF LICENSEE.**

13 (a) Section 16 of the Commercial Space Launch Act (49
14 U.S.C. App. 2615) is amended by striking "SEC. 16." and all
15 that follows through "other appropriate agencies." and in-
16 serting in lieu thereof the following:

17 "SEC. 16. (a)(1)(A) Each license issued or transferred
18 under this Act shall require the licensee—

19 (i) to obtain liability insurance; or

20 (ii) to demonstrate financial responsibility

21 in an amount sufficient to compensate the maximum probable
22 loss from claims against any party by a person or entity,
23 other than the licensee or a contractor, subcontractor, or cus-
24 tomer of the licensee involved in providing the launch serv-
25 ices, for death, bodily injury, or loss of or damage to property

1 resulting from activities carried out under the license. In no
2 event shall a licensee be required to obtain liability insurance
3 or demonstrate financial responsibility under this subpara-
4 graph in an amount which exceeds \$500,000,000.

5 “(B) Each license issued or transferred under this Act
6 shall require the licensee—

7 “(i) to obtain insurance; or

8 “(ii) to demonstrate financial responsibility

9 in an amount sufficient to compensate the maximum probable
10 loss from claims against any party by the United States for
11 loss of or damage to property of the United States resulting
12 from activities carried out under the license. In no event shall
13 a licensee be required to obtain insurance or demonstrate fi-
14 nancial responsibility under this subparagraph in an amount
15 which exceeds \$100,000,000.

16 “(C) Each license issued or transferred under this Act
17 shall require the licensee to—

18 “(i) enter into reciprocal waivers of claims; or

19 “(ii) obtain insurance,

20 in a manner and to an extent satisfactory to the Secretary,
21 and consistent with this section, with respect to claims by the
22 licensee or a contractor, subcontractor, or customer of the
23 licensee, or by a contractor or subcontractor of such custom-
24 er, involved in providing the launch services, for death, bodily

1 injury or loss of or damage to property resulting from activi-
2 ties carried out under the license.

3 “(D) The Secretary, on behalf of the United States, may
4 enter into reciprocal waivers of claims with respect to claims
5 for death, bodily injury, or loss of or damage to property
6 resulting from activities carried out under a license issued or
7 transferred under this Act.

8 “(2) Any insurance policy obtained pursuant to a re-
9 quirement described in paragraph (1) shall name the United
10 States and all contractors, subcontractors, and customers of
11 the licensee, and all contractors and subcontractors of such
12 customers, involved in providing the launch services as in-
13 sured parties, to the extent of their potential liabilities, at no
14 cost to the United States.

15 “(3) The Secretary shall determine the maximum prob-
16 able loss associated with activities under a license within 90
17 days after a licensee has requested such a determination and
18 has submitted all information the Secretary requires to make
19 such a determination. The Secretary shall amend such deter-
20 mination as warranted by new information.

21 “(4) The Secretary shall, once every 3 years after the
22 date of the enactment of the Commercial Space Launch Act
23 Amendments of 1987, review the amounts specified in the
24 last sentence of subparagraphs (A) and (B) of paragraph (1),
25 and shall submit a report to the Congress which contains a

1 proposed adjustment to such amounts to conform with altered
2 liability expectations. Such proposed adjustment shall take
3 effect 30 days after the submission of such report.

4 “(b)(1) The Secretary shall provide for the payment of
5 successful claims (including reasonable expenses of litigation
6 or settlement) against the licensee, or any contractor, subcon-
7 tractor, or customer of the licensee, or any contractor or sub-
8 contractor of such customer, involved in providing launch
9 services undertaken pursuant to a license under this Act, by
10 a party other than—

11 “(A) the United States;

12 “(B) the licensee; or

13 “(C) a contractor, subcontractor, or customer of
14 the licensee, or a contractor or subcontractor of such
15 customer, involved in providing the launch services,
16 for death, bodily injury, or loss of or damage to property
17 resulting from activities carried out under the license, but
18 only to the extent that such claims are not compensated by
19 insurance, including self-insurance pursuant to subsection
20 (a)(1)(A)(ii). This paragraph shall not apply to claims result-
21 ing from the willful misconduct of such parties.

22 “(2) Payment of claims under paragraph (1) shall be
23 subject to—

24 “(A) notice to the United States of any claim or
25 suit against a party described in paragraph (1) for

1 death, bodily injury, or loss of or damage to property;
2 and

3 “(B) control of or assistance in the defense by the
4 United States, at its election, of that claim or suit.

5 “(3) The Secretary may withhold payment under para-
6 graph (1) if the Secretary certifies that the amount is not just
7 and reasonable.

8 “(4) The Secretary shall make payments under para-
9 graph (1) in accordance with section 1304 of title 31, United
10 States Code.”.

11 (b) Section 15(c) of the Commercial Space Launch (49
12 U.S.C. App. 2614(c)) is amended to read as follows:

13 “(c) The Secretary may establish requirements for proof
14 of financial responsibility and such other assurances as may
15 be necessary to protect the United States and its agencies
16 and personnel from liability, loss, or injury as a result of a
17 launch or operation of a launch site involving Government
18 facilities or personnel. The Secretary may not under this sub-
19 section relieve the United States of liability for damage or
20 injury resulting from negligence or intentional misconduct of
21 the United States or its agents.”.

22 **SEC. 5. UNITED STATES LAUNCH INCENTIVES FOR CERTAIN**
23 **SATELLITES.**

24 (a)(1) Except as otherwise provided in this subsection,
25 the Secretary of Transportation shall act as insurer for any

1 launch involving an eligible satellite in the amount required,
2 pursuant to section 16(a)(1) (A) and (B) of the Commercial
3 Space Launch Act, for activities under a license issued under
4 such Act.

5 (2) The Administrator of the National Aeronautics and
6 Space Administration shall, upon application of the owner of
7 an eligible satellite, determine the amount such owner would
8 have been required to pay for liability insurance for third
9 party claims for the launch of such satellite under the terms
10 of the launch services agreement or contract referred to in
11 subsection (c).

12 (3) The owner of an eligible satellite shall be responsible
13 for obtaining insurance required pursuant to section 16(a)(1)
14 (A) and (B) of the Commercial Space Launch Act in an
15 amount equal to the amount determined under paragraph (2)
16 of this subsection, adjusted for inflation with respect to the
17 period between the time insurance would have been required
18 to be obtained as described in paragraph (2) and the time
19 insurance is required to be obtained pursuant to section
20 16(a)(1) (A) and (B) of the Commercial Space Launch Act.

21 (b) The Secretary of Transportation, with the coopera-
22 tion of the Secretary of Defense and the Administrator of the
23 National Aeronautics and Space Administration, and in con-
24 sultation with, and after due consideration of the interests of,
25 the owners of eligible satellites, their launch providers, and

1 other customers of such launch providers, shall, wherever
2 practicable, take steps to ensure that eligible satellites re-
3 ceive priority status for launch from United States launch
4 sites in the order in which such eligible satellites were mani-
5 fested by the National Aeronautics and Space Administration
6 as of August 15, 1986.

7 (c) The United States shall not require payment for the
8 provision of launch property and launch services in connec-
9 tion with the launch of an eligible satellite.

10 (d) A satellite shall be eligible for the purposes of this
11 section if—

12 (1) it was under construction on August 15, 1986;

13 (2) an unperformed launch services agreement or
14 contract with the National Aeronautics and Space Ad-
15 ministration was held with respect to it on August 15,
16 1986; and

17 (3) it is licensed for launch under the Commercial
18 Space Launch Act.

19 **SEC. 6. PREEMPTION OF SATELLITES.**

20 Section 15(b) of the Commercial Space Launch Act (49
21 U.S.C. App. 2614(b)) is amended by adding at the end the
22 following new paragraph:

23 “(5)(A) The Secretary of Transportation, with the coop-
24 eration of the Secretary of Defense and the Administrator of
25 the National Aeronautics and Space Administration, shall

1 take steps to ensure that the launches of satellites with re-
2 spect to which a launch date commitment from the United
3 States has been obtained for a launch licensed under this Act
4 are not unreasonably preempted from access to United States
5 launch sites or property except in cases of imperative nation-
6 al need.

7 “(B) The Secretary of Transportation shall include in
8 any license issued under this Act a provision which estab-
9 lishes an amount of liquidated damages to be paid by the
10 preempting agency of the United States in the event that a
11 satellite is preempted other than as provided in subparagraph
12 (A).”.

13 **SEC. 7. STUDY OF PROCESS FOR SCHEDULING LAUNCHES.**

14 The Secretary of Transportation, in cooperation with
15 the Secretary of Defense and the Administrator of the Na-
16 tional Aeronautics and Space Administration, and in consul-
17 tation with representatives of the space launch and satellite
18 industry, shall study ways and means of scheduling Govern-
19 ment and commercial payloads on commercial launch vehi-
20 cles at government launch sites in a manner which—

21 (1) optimizes the use of the launch property of the
22 United States; and

23 (2) assures that the launch property of the United
24 States that is available for commercial use will be
25 available on a commercially reasonable basis,

1 consistent with the objectives of the Commercial Space
2 Launch Act. The Secretary shall submit the results of such
3 study to the Congress within 90 days after the date of the
4 enactment of this Act.

5 **SEC. 8. COMMERCIAL SPACE LAUNCH SERVICE COMPETITION.**

6 It is the sense of the Congress that the United States
7 should explore ways and means of developing a dialogue with
8 appropriate foreign government representatives to seek the
9 development of guidelines for access to launch services by
10 satellite builders and users in a manner that assures the con-
11 duct of reasonable and fair international competition in com-
12 mercial space activities.

13 **SEC. 9. LAUNCH VEHICLE RESEARCH AND DEVELOPMENT**

14 The Administrator of the National Aeronautics and
15 Space Administration shall design a program for the support
16 of research into launch systems component technologies, for
17 the purpose of developing higher performance and lower cost
18 United States launch vehicle technologies and systems avail-
19 able for the launch of commercial and Government spacecraft
20 into orbit. The Administrator shall submit a report outlining
21 such program to the Congress within 60 days after the date
22 of the enactment of this Act.

1 SEC. 10. APPLICABILITY TO LICENSES.

2 This Act, and the amendments made by this Act, shall
3 apply to all licenses issued under the Commercial Space
4 Launch Act before or after the date of the enactment of this
5 Act.

○

APPENDIX 2

DEPARTMENT OF THE AIR FORCE
MODEL EXPENDABLE LAUNCH VEHICLE
COMMERCIALIZATION AGREEMENT

JANUARY 1988
(REVISION)

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ATTACHMENT 1 Statement of Real Property, Facilities, Goods and Services

APPENDICES

- A. Eastern Space and Missile Center Support
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ARTICLE I - INTRODUCTION

a. This Agreement (hereinafter the "Agreement") is entered into between the United States Air Force (hereinafter referred to as the "Air Force" or the "Government") (hereinafter referred to as the "User"). This agreement is made pursuant to the authority of the Commercial Space Launch Act of 1984, 49 U.S.C. 2601-23, and the Military Leasing Act, 10 U.S.C. 2667. It is not subject to the provisions of the Federal Acquisition Regulations (FAR), except insofar as particular FAR provisions are specifically stated to be made applicable. Unless specifically stated to the contrary, all references to the Government throughout this agreement shall mean the U.S. Air Force or its appropriate elements(s). This Agreement sets forth the terms and the conditions under which the Air Force will furnish real property, facilities, goods and services to the User in support of production and/or launching of commercial expendable launch vehicles ("ELV's") on a cost-reimbursable basis.

b. This Agreement is made pursuant to and in conformity with Attachment 1 the Statement of Real Property, Facilities, Goods and Services dated _____ (hereinafter referred to as the Statement), which sets forth the real property, facilities, goods and services to be provided by the Government in support of production and/or launching of commercial ELVs.

c. In the event of an inconsistency, unless otherwise expressly provided herein, such inconsistency shall be resolved by giving precedence in the following order:

1. Articles I through XIX of this Agreement;
2. Attachment 1, Statement of Goods and Services; and
3. Annexes A, B, and C of this Agreement.

ARTICLE II - GOVERNMENT ACTIONS

1. The Government will make all reasonable efforts to minimize adverse impacts its actions may have on commercial operations and accord commercial users a high degree of stability in conducting their commercial launch business.

2. Whenever in this Agreement the doing of an act or the exercise of any right by the User is conditioned upon receipt of approval, permission, agreement, authorization, or any other form of cooperation or acquiescence by the Government, the Government shall promptly render its decision and shall neither unreasonably withhold nor unreasonably condition its approval of a request by the User. In all its actions relative to the maintenance, operation, development, and management of the range, the Government will conduct itself in a reasonable and prudent manner.

ARTICLE III - DEFINITIONS

Agency. An executive agency of the Government as defined by section 105 of title 5, United States Code.

Centers. Eastern Space and Missile Center (ESMC), Patrick AFB, FL and Western Space and Missile Center (WSMC), Vandenberg AFB, CA.

Contracting Officer. (including "ACO" or "PCO"). Means the duly authorized representative of the Eastern Space and Missile Center Commander or the Western Space and Missile Center Commander, as appropriate.

Direct Cost. Cost identified as such in Department of Defense Directives (DoDD's) 3230.3 and 3200.11.

Facility. Property used for production, maintenance, research, development, or testing. It includes plant equipment and real property, but not material, special test equipment, or special tooling.

Government Property. All property, real or personal, that is owned or leased by the Government. It consists of materials, special tooling, special test equipment, military property, facilities, and software.

Launch. To place or attempt to place a launch vehicle and payload, if any, in any sub-orbital trajectory, in Earth orbit in outer space, or otherwise in outer space.

Launch Property. Propellants, launch vehicles and components thereof, and other physical items constructed for or used in the launch preparation or launch of a launch vehicle.

Launch Services. Those activities involved in the preparation of a launch vehicle and its payload for launch and the conduct of a launch.

Launch Site. The location on earth from which a launch takes place, including all facilities located on a launch site which are necessary to conduct a launch.

Launch Vehicle. Any vehicle constructed for the purpose of operating in, or placing a payload in outer space, and any sub-orbital rocket.

Liability. To include, but not be limited to, legal obligations pursuant to any Government treaty, any judgment by a court of competent jurisdiction, administrative and litigation costs, and settlement payments. To include such legal obligations that are the result of any environmental incident as further defined in the applicable Annex, Part IV.F.

Payload. An object which a person undertakes to launch into space or place in Earth orbit by means of a launch vehicle, including subcomponents of the launch vehicle specifically designed or adapted for that object.

Person. Any individual and any corporation, partnership, joint venture, association, or other entity organized or existing under the laws of any State or any nation.

Production and Research Property. Government-owned ELV production and research equipment and facilities, including special test equipment, and special tooling to which Government has title or the right to acquire title.

State and United States. When used in a geographical sense, mean the several States, the District of Columbia, the Commonwealth of Puerto Rico, American Samoa, the United States Virgin Islands, Guam, and any other commonwealth, territory, or possession of the United States.

Subcontractor. Supplier at any tier and any vendor.

United States Citizen.

(A) Any individual who is a citizen of the United States;

(B) Any corporation, partnership, joint venture, association, or other entity organized or existing under the laws of the United States or any State; and

(C) Any corporation, partnership, joint venture, association, or other entity which is organized or exists under the laws of a foreign nation, if the controlling interest (as defined by the Secretary of Transportation in regulations) in such entity is held by an individual or entity described in subparagraph (A) or (B) above.

ARTICLE IV - ALLOCATION OF RISKS

a. This article allocates the responsibility for paying for damages to Government property or for tort claims arising out of the commercial use of launch services, facilities, and equipment to be provided to Users by the Government and its contractors and subcontractors under this Agreement. To the extent that the financial responsibility for a risk of damage or liability is not settled by the terms of this Agreement, U.S. law shall govern the allocation of such responsibility between the User and the Government.

b. Definitions

For purposes of this Article,

1. "Damage" shall mean bodily injury or death of any person, damage to or loss of any property, real or personal, and loss of revenue or profits or other direct, indirect, or consequential damages therefrom. Such "Damage" shall include that caused by a release of or exposure to a hazardous substance, as that term is defined in Section 101(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. 9601, as amended by the Superfund Amendments and Re-authorization Act of 1986, and referenced authorities therein, or as the term may be further defined by future Federal legislation.

2. "Third-party liability" shall mean the legal liability of a party to this Agreement for damage to all persons or parties not signatory parties hereto. This includes the private claims for personal injury or death or damage to private property by contractors or subcontractors of either party, or by the employees or any of the above, or by US military personnel. It also includes civil liability for costs, fines, penalties, etc., imposed as a result of enforcement actions or other administrative or civil judicial actions for violation of Federal, State, or local laws, e.g., environmental laws, in the conduct of activities under this Agreement.

3. "Maximum available insurance" shall mean the amount of insurance available in the world market at a reasonable premium and on terms considered commercially reasonable for the risks involved to fund the User's responsibilities under this Agreement, or a specified provision of this Agreement.

4. "Launch" means, in addition to the definition in Article III, all activities in preparation for a launch, the act of launching itself, occurrences in the atmosphere, in space, or on Earth after descending from the atmosphere of space, and activities after the launch to clean up and refurbish Government or User property and to remove it from the launch site and any other Government or User facility.

c. Liability, Responsibility for Paying Claims, and Insurance

1. User shall assume the responsibility of paying for all damage to property of the User, the Government, or their contractors and subcontractors, and all third-party liability, arising out of this agreement, regardless of fault, to the extent of the maximum available insurance for the specific launch except that the User shall not be responsible for damage caused by the intentional misconduct of the Government and the Government's contractors and subcontractors.

2. To fully assume the third-party liability stated above, the User shall indemnify and hold harmless the Government, its contractors and subcontractors, and the agents, servants, employees and military personnel of each of them, including paying their attorney's fees, from any third-party liability arising out of activities under this Agreement. These include, but are not limited to, the production of launch vehicles and associated equipment or facilities, marketing of launch services, use of Government services or facilities, launch operations, use of space flight vehicles or their payloads in flight or in space, damage caused by its space objects upon the Earth or to aircraft in flight, and environmental incidents or legal violations.

3. To the extent that Government damages and/or third-party claims which arise in connection with a specific launch are in excess of the amount of the maximum available insurance for that launch, questions of liability between parties and responsibility for paying claims will be left for resolution according to the applicable law of the U.S. (e.g., tort law, the Federal Tort Claims Act).

4. The User's liability and responsibility to pay claims assumed above and covered by its indemnification and hold harmless commitments shall be covered, up to the maximum amount of insurance, by an appropriate insurance policy or policies procured by the User. The maximum amount of commercially available insurance and what is a reasonable price for such insurance for a specific launch or particular associated activities shall be determined by the Government. Its decision on the issue shall be final and not subject to Article IX, Disputes. The User shall provide to the Government a copy of the executed insurance policy or policies required under this Article, or other evidence satisfactory to the Government, within a reasonable time before commencement of each of the commercial launch activities to which the insurance relates. The terms of all such insurance must be acceptable to the Government. The Government

shall be a named insured under all such policies, and the policies shall renounce any right of subrogation against the Government. Such insurance shall be kept in effect throughout the activity or period of time to which the insurance relates. The User shall provide the Government with written notice at least 30 calendar days prior to cancellation or material change in policy coverage, and shall promptly provide the Government with copies of other policy modifications as they occur.

5. The extent of the User's liability or responsibility for paying claims, up to the amount of maximum available insurance, shall not be reduced by amounts:

(a) which are within the deductible amounts of the User's insurance policies; or

(b) which are not covered by the insurance because of an exclusion or other policy limitation, except for the maximum dollar limit stated in the policy, provided that this subparagraph shall not apply to policy exclusions or limitations which are reasonably determined by the Air Force to be usual for the type of insurance involved, and consistent with the User's obligation to obtain the maximum amount of insurance; or

(c) of payments to its clients, contractors, or subcontractors for a liability incurred to that client, contractor, or subcontractor; or

(d) of settlement payments, unless such settlements are agreed to by the Government.

6. The User's insurance and assumption of liability to the Government hereunder shall not be the exclusive recourse of the United States in the event that the Government is for any reason unable to recover for such liability and damage from the insurance provider or the User. The United States reserves the right to pursue claims or bring appropriate legal action against the User or any other responsible party for its damage or for liability incurred under U.S. or international law or agreement.

7. The Government agrees to cooperate with the User in obtaining any information, data, reports, contracts, and similar materials in connection with the presentation of any claim by the User under any policy of insurance provided pursuant to the requirements of this Article.

8. The User shall be subject to established or general Government liability insurance requirements with respect to access to and use of Government or Government contractor property, to the extent not expressly and specifically addressed in this Agreement. These include, but are not limited to, providing and maintaining insurance, at no cost to the government, of at least the types and in the amounts set forth below:

(a) Worker's Compensation - \$100,000,

(b) Employer's Liability - \$100,000,

(c) Comprehensive Automobile Liability - In accordance with general installation regulations; and

(d) Insurance required by Federal, State, or local environmental protection laws and regulations.

9. The User shall:

(a) promptly notify the Government of any claim or action against, or any loss by, the User or any contractors/subcontractors or their parties in privity of contract therewith;

(b) immediately furnish to the Government copies of all pertinent papers the User receives regarding any such claim or action.

d. Government Property

1. All government property is to be furnished "as is," the Government makes no warranty, express or implied, whatsoever, regarding its property.

2. The User may inspect Government property prior to use. Such property may be repaired or modified at the User's expense only after obtaining the written permission of the Government. Any repair or modification of such property shall not affect the title of the Government. The User shall at no expense to the Government, return any modified property to the condition in which it was received, unless the Government agrees otherwise.

e. Patent Infringement Claims

1. The User agrees to reimburse the Government for any cost incurred by the Government as a result of an unlicensed use (infringement) of privately owned U.S. patents to the extent that any such costs are attributable to products, processes, or articles of manufacture actually used by the Government in connection with the furnishing of services to the User under provisions of this Agreement. Such costs shall include, but are not limited to, administrative and litigation costs, and settlement payments made by the Government as a result of administrative consideration of claims against the Government for infringement of such patents, as well as costs incurred by the Government in the form of a judgment against the Government by a court of competent jurisdiction.

2. If the User is licensed under a privately owned third party patent, and to the extent that the launch and associated services furnished by the Government under this Agreement constitutes a licensed use under the User's license and is not covered by a Government license, any compensation for such use shall be handled directly by the User with the third party licensor. In the event it is the decision of either the third party licensor or the User, or both, that such use is not within the scope of the User's license, then the use will be considered an unlicensed use and governed by the terms and conditions of this agreement.

3. The reimbursement by the User of costs associated with patent infringement settlements or judgments will be governed solely by this clause. Therefore, except as provided in subparagraph e.1. above, the User shall have no liability to the Government with respect to any third party claim against the Government of patent infringement by the Government in connection with the

furnishing of services to the User under the provisions of this Agreement. Further, any costs reimbursable to the Government by the User under the provisions of this agreement shall be reduced pro rata by any amount actually paid to the Government by a third party or to which the Government has a right to payment from a third party as reimbursement or indemnification for any or all of the patent infringement costs of this agreement.

4. The Government will notify the User as promptly as possible of any patent infringement claim asserted against the Government, whether by suit or otherwise, under which the User might be liable for reimbursement of costs. In particular, the Government will notify the User prior to any administrative settlement of a claim under this agreement, and as promptly as possible after the institution of any suit, and preferably before same, based on such a claim. With respect to costs reimbursed by the User under this agreement, the Government will, promptly after paying any such costs, present the User with a statement itemizing in reasonable detail such costs and identifying the applicable patents associated therewith. Within thirty (30) calendar days after receipt of the Government statement of such costs, the User shall have the right to request a review of its correctness.

5. With respect to any suit against the Government based on a claim of patent infringement, the costs for which the User would be liable under this agreement, the Government agrees that, subject to law and regulations of the Department of Justice, the User may, at its option, assume a major role in the defense of the suit. The User's right of election to assume a major role in the defense of such a suit shall not in any way affect any other rights otherwise available to it under contract or general principles of law. In particular, should the User not exercise such option, its right to intervene in the suit, under applicable rules or procedures, shall in no way be affected or diminished.

ARTICLE V - SAFETY AND ACCIDENT PREVENTION

a. The User shall:

1. Conform to all applicable laws and regulations governing safety and accident prevention, including the specific safety requirements contained in the WSMC and ESMC annexes to this Agreement.

2. Provide an adequate safety organization within its company that can effectively interface with the safety requirement of Range Safety organizations at ESMC and WSMC.

3. Take all reasonable steps and precautions to comply with and implement, as required by the Ranges, their respective safety programs as outlined in ESMCR and WSMCR 127-1, the applicable safety criteria prescribed in AFR 127 series, specific AF Occupational, Safety and Health (AFOSH) Standards/Regulations and Air Force Explosive Safety Regulations as specified by the Ranges from AFR 127-100. All subsequent editions, revisions, and supplements to these regulations shall be implemented within a mutually agreeable time schedule. User agrees to take all reasonable steps and precautions to prevent accidents, to preserve the life and health of all Users, Government, and operating contractor personnel and the general public that may in any way be affected by the User in the performance of this agreement. Violations of the Government's

rules and regulations shall be grounds for the temporary suspension of work until the violations are corrected and ultimately may be grounds for termination of this Agreement, in accordance with Article XV, Termination by Government. The User agrees that Government safety representative will be allowed access to all facilities utilized in the performance of this Agreement, all paper work, system components, sub-system designs, operating/emergency procedures and any other material deemed necessary by the Government. The Government may by written order direct additional safety and accident standards as required for the performance of this Agreement. This access will be limited to the purpose of confirming the User's compliance with the safety requirements set forth in sub-paragraphs 1, 2, and 3 above. Any information or data accessed by the Government will be subject to protection as set forth in Article VIII, Information Disclosure.

b. The Government may assign such personnel as it deems necessary to monitor the safety of activities of the User or its contractors and subcontractors at any launch site, production facility, assembly site, or site where a payload is integrated with a launch vehicle. The costs occasioned thereby shall be considered direct costs. This monitoring will be limited to the purpose of confirming the User's compliance with the safety requirements set forth in subparagraphs 1, 2, and 3 above. Access to facilities or monitoring activities at other than the Government's ESMC or WSMC sites will require a 48 hour courtesy notice to the User by the Government to include the number of personnel involved. The number of government personnel to visit the facility and the purpose of the visit will be by mutual agreement of the parties. By conducting monitoring, the Air Force does not assume responsibility for the User's safety compliance, nor relieve the User of the primary responsibility to meet all applicable standards.

c. In the event of any accident involving injury, damage to, or loss of personnel or property, including real or personal property, the Government reserves the right to conduct complete investigations into the events surrounding the accident. The User agrees to support these investigations to the extent deemed necessary by the Government. When the Air Force is conducting the investigations, then the User will, in accordance with AFR 127-4, provide access to all documents and personnel who may have relevant information.

d. Compliance with subparagraphs a. through c. above shall not relieve the User from its obligations under this Agreement.

e. Notwithstanding any other provision of this agreement, the U. S. Government shall not be liable for damages incurred by the User or commercial system operator resulting from Government execution of flight termination systems or other Range Safety actions. The User shall indemnify and hold the Government harmless from any and all such claims.

ARTICLE VI - PERMITS AND RESPONSIBILITIES

a. Except as otherwise provided in this Agreement or any Annex or attachment hereto specifically with respect to environmental permits the User shall comply, at its own cost and expense, with all Federal, State, or local laws and regulations which may be applicable to the operation of its business at a national range, including obtaining and paying for all necessary licenses and permits and paying all fees and charges.

- b. The User shall have provided to the PCO a copy of its current commercial space launch activities license, issued by the Department of Transportation, 10 days before a launch.

ARTICLE VII - LAUNCH DATA

- a. The User shall prepare a quick look technical report which will provide the Center Commander with a brief description of: (1) the launch and spacecraft mission, (2) flight events summary, and (3) launch vehicle and spacecraft performance and a discussion of any safety anomalies that may have occurred. This report will be submitted 48 hours following launch.

- b. Any such data obtained by the government shall be protected in accordance with Article VIII, information disclosure.

ARTICLE VIII - INFORMATION DISCLOSURE

Technical Data Furnished to the Government by the User

- a. To the extent that the user provides to the Government any information it considers to be proprietary and any data in which it considers to have limited rights, the User shall identify such information and data by marking it as such by the time such information and data is provided to the Government.

- b. Within the Government and its contractors disclosure of any information and data provided to the Government with the markings described in subparagraph a. above shall be limited only to persons having a need to know and in support of the launch and associated services to be provided under this Agreement. Disclosure to any non-Government person shall be provided only after such person has agreed in writing to protect the subject information and data from unauthorized use, duplication, and disclosure.

- c. Any markings on proprietary information and data with limited rights shall be retained on any reproduction of such data in whole or in part.

- d. Notwithstanding the limitation on distribution of data among government and government contractor employees, any information and data provided to the Government with the markings described in subparagraph a. above shall be protected by the Government as provided in subparagraph c below and in accordance with the Freedom of Information Act, 5 U.S.C. 552, and Air Force Regulation 12-30.

ARTICLE IX - DISPUTES

- a. Except as otherwise provided in this Agreement, all disputes arising under or relating to this Agreement shall be resolved under this Article. Any dispute arising under this Agreement which is not disposed of by agreement between the User and the Government shall be decided by the Contracting Officer, who shall reduce his decision to writing within 60 days and mail or otherwise furnish a copy thereof to the User.

b. The decision of the Contracting Officer shall be final and conclusive unless, within 30 days from the date of receipt of such copy, the User mails or otherwise furnishes to the Contracting Officer a written appeal addressed to the Secretary of the Air Force. The decision of the Armed Services Board of Contract Appeals as the duly authorized representative of the Secretary of the Air Force shall be final and conclusive concerning questions of fact unless determined by a United States court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence. In connection with any appeal proceeding under this Article, the User shall be afforded an opportunity to be heard and to offer evidence in support of his appeal. Pending final decision of a dispute hereunder, work under the Agreement will continue as elsewhere provided herein.

ARTICLE X - PROPERTY DISPOSITION

a. At the conclusion of performance as required hereunder, the User agrees to remove all User property at no cost to the Government, within sixty (60) days. User property will be considered abandoned unless the ACO is notified otherwise in writing within sixty (60) days after project completion. Property not removed within a reasonable time thereafter may be considered by the ACO to be abandoned.

b. User shall be charged all direct costs incurred by the Government associated with the disassembly, removal, storage, shipping, and/or disposal of any User property abandoned under subparagraph a. above.

ARTICLE XI - FINANCIAL ARRANGEMENTS

a. The User will reimburse the Government for all direct costs incurred by the Government in connection with or incidental to the furnishing of goods and services under this Agreement which are deemed by the Government to be proper. Such reimbursable direct costs shall be determined and charged in accordance with the following principles and procedures:

1. Public Law 98-575, Section 15
2. NSDD-94
3. Executive Order 12465 February 24, 1984
4. Department of Defense Directives 3230.3 and 3200.11
5. Any conflicts within these principles and procedures will be resolved by giving precedence in the order listed.

b. The parties recognize that the User does not obtain title or any other legal or equitable right or interest in, any property, real or personal, by reimbursing the Government for part of the costs of that property, pursuant to this Agreement.

c. The User shall reimburse the Government in accordance with the following:

1. Estimate of costs

(a) Annex C of this Agreement sets forth the Government's estimate of the total direct costs which will be incurred in connection with the providing of goods and services.

(b) The estimate of direct costs shall be updated and submitted to the User by the ACO if events occur that would make the current estimate differ significantly.

2. Payment.

(a) The User shall make two incremental deposits with the Government's accounting and finance office at ESMC or WSMC as follows. The first will be an amount equal to the estimated costs as set forth in Annex C for the first six months of the Agreement, exclusive of test support and launch support. This deposit will be made at least ten working days prior to the Government's commencement of its obligation to perform. The second deposit will be an amount equal to 100% of the test support and launch support costs and will be due 120 days prior to the scheduled launch date. Both of these deposits will be credited to the User's account and will be debited on a monthly basis as set forth below. Any balance remaining at the end of this Agreement will be returned to the User. When lengthy time periods may elapse between conclusion of a launch and the Government's next commencement of performance under this Agreement, the parties may agree to liquidate this deposit and then reestablish another deposit at least 10 days prior to the start of additional performance by the Government with the second deposit due 120 days prior to scheduled launch. Liquidation will follow the settlement procedures set forth below.

(b) Each month the Government will draw down from the User's account an amount equal to the previous month's actual direct costs incurred by the Government in the performance of this Agreement. The User will receive monthly statements. The User shall replenish the account quarterly to a level equal to the next 6 months' costs. The Government's performance under this agreement will be suspended if, in the estimate of the ACO, insufficient funds remain in the account to cover the next 45 days of Government cost. Work may not be suspended by the Government without first notifying the User, in writing, three working days prior to suspension.

(c) If during the term of this Agreement the User repeatedly fails to make quarterly replenishments, then the Government may terminate this Agreement pursuant to Article XIV, Termination by the Government.

NOTE: The Air Force is willing to consider alternate methods of effecting payment. Any alternate method such as using interest-bearing commercial escrow accounts, letters of credit, etc., can be discussed at the time of individual Agreement executions. Any proposed alternate payment method must provide for timely monthly payments to the Government and a guarantee of prompt payment to the Government once the service has been performed.

3. Settlements

(a) Interim settlements will occur either annually or at the conclusion of a launch, at the election of the User. Additionally, a final settlement will occur at the completion of this Agreement. As promptly as possible after these events, the ACO will:

- (1) Make a determination of the actual direct costs.

(2) Report the results to the User.

(b) The User's account will be debited for any Government direct costs not previously recorded against the User's account.

4. The User shall have a right to request review of the direct costs as set forth below. If the User's account contains a surplus after a completion of launch interim settlement, the User may elect to withdraw the surplus provided that a new account is established 10 days prior to the start of additional performance by the Government. Otherwise, the remaining balance will count against future work. Surplus funds remaining after an annual interim settlement will be retained for future use. Surplus funds remaining after a final settlement will be returned to the User. It is understood that the above provision does not constitute authorization to defer or postpone payments due under this Agreement. All amounts that become payable to the Government after any settlement shall bear an interest charge if they are not paid within 30 calendar days of receipt. The interest to be charged shall be an amount computed at the rate established for interest due to the Government by the Department of Treasury effective on the due date. Interest shall be computed on the actual number of days after the due date on the basis of 360 days in a calendar year.

5. Appeals

The User shall have the right to request a review of the direct costs within 30 days after receipt of a monthly statement or any settlement determination. After conducting the requested review, the ACO shall make a final written decision regarding direct costs. Disagreement on the final decision will be considered under Article IX, Disputes. The amount of direct costs being disputed under the Disputes Article shall not be deductible from the User's account in the case of monthly billings nor shall it not be due and payable in the case of a settlement until a final resolution under the Article IX, Disputes, is reached. However, interest shall accrue in favor of the Government on any direct costs sustained under the dispute proceedings starting from the date the PCO receives a request for a final decision under the Disputes Article and ending when the sustained amount is deducted from the User's account or paid by the User to the Government. Interest shall be calculated as set forth above.

ARTICLE XII - SUPPORT INTERRUPTIONS

a. The use or commitment of Center resources shall be requested in accordance with applicable and updated range scheduling regulations.

b. The Centers will act in good faith and negotiate to minimize scheduling and support conflicts. It is the government's intention to accord commercial users a high degree of stability in conducting their commercial launch business. The Centers shall provide facilities and services in accordance with applicable and updated policies and procedures. In areas where conflicts may occur, the following ground rules shall apply:

1. The Government shall have priority in the use of Government property, and support services to meet national security interests or U.S. government mission requirements. The government decision to exert its first priority rights shall be made by the Center Commander. In the event the Government asserts its first priority right, the Government will make its best effort to coordinate with the User in advance (except in emergency situations when the Government must act immediately) so that the User may adjust its work schedules to minimize the impact of an interruption.

2. The User access to Government property, facilities, equipment, and support services is provided on a non-interference basis, with the express understanding that even when the User has been provided access, the Government may invoke its right to first priority access.

3. The Government reserves the right to require User personnel to vacate the launch complex or other work areas when their presence would constitute a safety, health, or security hazard due to launch or other activities at adjacent facilities on Cape Canaveral Air Force Station, Kennedy Space Center or Vandenberg AFB.

4. Hazardous operations at the launch site area will be approved by either WSMC or ESMC range scheduling as appropriate.

c. The Government shall not be liable for any costs, including but not limited to consequential damages incurred by third parties, the User, its contractors, or subcontractors as a result of any interruption.

ARTICLE XIII - TERMINATION BY USER

a. The User may terminate this Agreement at any time by notifying the PCO in writing. Should the User elect to terminate this Agreement, it will reimburse the Government for all direct costs incurred up to the date of receipt by the PCO of its termination notice and shall also reimburse the Government for all direct costs incurred in restoring the facility and equipment to the condition they were in before preparations were made to conduct the launch services, as well as other termination costs resulting directly from the termination, pursuant to Article XI, Financial Arrangements.

b. The rights and remedies of the Government provided by this clause are in addition to any rights and remedies provided by law or otherwise in this Agreement.

ARTICLE XIV - TERMINATION BY GOVERNMENT

a. The Government may terminate this Agreement in its entirety immediately upon the happening of any of the following events. Such termination shall be effective on the thirtieth (30th) day after receipt of written notice by the User:

1. The User voluntarily abandons or discontinues commercial space transportation operations, and shows no evidence that it will resume its efforts within a reasonable period of time, provided, however, that suspension of operations by the User during a strike or work stoppage by its employees, shall not be considered voluntary abandonment or discontinuance of operations.

2. The User has demonstrated an inability to conduct its operations in a safe manner, has jeopardized personnel and property through its actions, and, despite notice to correct its safety deficiencies, shows no evidence of correcting its shortcomings.

3. The User is in arrears in its payments.

4. Requirements are developed for critical, conflicting national security or other governmental launches or launch activities which cannot be reasonably satisfied by such means as schedule adjustment, and therefore preclude the Government from making available to the User, as excess capacity, all or substantial portions of the Government facilities and services otherwise provided for in this Agreement.

b. If the Government terminates this agreement it shall not be liable for any costs, including, but not limited to consequential damages or any other costs, experienced by third parties, the User, its contractors or subcontractors as a result of such termination.

ARTICLE XV - PERSONNEL ASSURANCE PROGRAM

a. This clause applies only to Users who will require employee access to launch pads or payload processing facilities on a "shared basis" with the Government, i.e., those launch pads or payload processing facilities that are also used to conduct Dept of Defense (DOD) launches.

b. HQ Space Division Regulation (SDR) 55-3, 30 June 1986, as it may be supplemented or revised, requires certification of all personnel whose duties require access to DOD flight hardware (those elements of equipment necessary for the attainment of operational capability of a DOD ballistic or DOD satellite program), who occupy a command and control position (a position where the incumbent has direct responsibility for conducting a DOD launch or expenditure of a DOD missile or DOD space booster), or whose duties require technical knowledge or competence vital to the successful accomplishment of the ultimate mission of a DOD ballistic or DOD satellite program. It is anticipated that User employees performing work under this Agreement which requires use of shared DOD property facilities or resources may fall into the first of the above categories. The User shall identify such employees and take steps to have each such employee certified in accordance with the procedures set out in SDR 55-3, unless such employee is otherwise certified under a reciprocal program recognized under SDR 55-3.

c. The User shall provide a copy of the list of employees so identified to the ACO. The ACO reserves the right to identify additional positions which shall be required to be subject to certification under SDR 55-3 if it is in the best interests of the Government to do so.

d. It is the User's sole responsibility to assure that employees capable of certification under SDR 55-3 are utilized in positions requiring such certification under this Agreement. In the event an individual identified as occupying a position requiring certification is denied certification, the User shall take appropriate steps to deny entry to the range for that individual.

ARTICLE XVI - APPLICABLE LAW

The parties hereby designate the United States law to govern this Agreement for all purposes, including but not limited to, determining the validity of this Agreement, the meaning of its provisions, and the rights, obligations, and remedies of the parties.

ARTICLE XVII - ASSIGNMENT OF RIGHTS AND RESPONSIBILITIES

The User shall not assign any part of its rights or responsibilities under this Agreement. This shall not prohibit the Government, however, from recognizing a third party as the User's successor in interest to this agreement when the third party's interest in the contract arises out of the transfer of (1) all the contractor's assets or (2) the entire portion of the assets involved in performing the agreement.

ARTICLE XVIII - CHANGES

Should the policy of the U.S. Government, as reflected by statute, regulation, rule, practice, or otherwise, subsequently authorize the Air Force to change the terms of this Agreement, the Air Force agrees to modify this Agreement, at the User's request, to reflect such changes. Those changes shall be retroactive to the maximum extent permitted by that policy.

ARTICLE XIX - EFFECTIVE DATE OF AGREEMENT

This Agreement shall enter into force and effect the date of the last signature of the parties.

ARTICLE XX - SCOPE OF AGREEMENT

To be completed in individual agreements.

In witness whereof, the parties have executed this Agreement.

FOR THE GOVERNMENT

FOR THE USER

SIGNATURE:

SIGNATURE:

TYPED NAME:

TYPED NAME:

TITLE: _____

TITLE: _____

DATE: _____

DATE: _____

ATTACHMENT 1
STATEMENT OF REAL PROPERTY, FACILITIES,
AND SERVICES
JANUARY 1988

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ATTACHMENT 1

STATEMENT OF REAL PROPERTY, FACILITIES, GOODS AND SERVICES

1. INTRODUCTION

This Statement provides for the implementation of The Commercial Space Launch Act, Public Law 98-575, dated 30 October 1984, and the National Security Decision Directive (NSDD) No. 94, Commercialization of Expendable Launch Vehicles, dated 16 May 1983, and defines Government support in production and launching of commercial Expendable Launch Vehicles (ELV).

2. DEFINITIONS

For purposes of this Statement of Goods and Services, unless otherwise specified, the definitions addressed under the basic Agreement shall be applicable.

3. APPLICABLE FAR AND DoDD/DoDI WAIVERS

(a) The following Federal Acquisition Regulation (FAR), Department of Defense Directive (DoDD), and Department of Defense Instruction (DoDI) waivers have been approved by the Secretary of Defense and are applicable to this Agreement.

A. DoD Directive 3200.11, "Major Range and Test Facility Base." Waive paragraphs E.3.b., E.3.c. for all U.S. Government and U.S. commercial ELV launches. Pricing for all U.S. Government and U.S. commercial ELV launches will comply with paragraphs E.3.a. on direct cost.

B. DoD Instruction 7230.7, "User Charges." Waive recoupments from U.S. commercial ELV operators for other than direct costs.

C. DoD Directive 2140.2, "Recoupment of Nonrecurring Costs on Sales of U.S. Products and Technology." Waive recoupments from U.S. commercial ELV operators required by DoD Directive 2140.2.

D. DoD FAR Supplement, Subpart 35.71, "Recovery of Nonrecurring Cost on Commercial Sales of Defense Products and Technology." Waive recoupments of nonrecurring and development cost for Government ELV development from U.S. commercial ELV operators required by DoD FAR Supplement Subpart 35.71.

E. FAR para 45.407(a), "Non-Government use of Plant Equipment." Waive requirement for Agency Head approval for use of Government equipment by non-Government organization. Approval may be made by the head of the activity providing the use.

F. FAR, para 45.603, "Disposal Methods." Allows the sale of dedicated expendable launch equipment directly to commercial ELV operators.

G. FAR, para 45.610-2, "Exemptions from sale by GSA." The Commercial Space Launch Act authorizes the Air Force to sell launch property to commercial ELV Users. If personal property other than "launch property," as defined in the Act, or real property (including fixtures) is sought by the User,

the Air Force will seek either GSA approval of the sale or delegation of competitive and negotiated disposal authority to the Air Force. As an alternative, real property, including fixtures, may also be provided to the user directly by the Air Force under long-term lease, pursuant to the Military Leasing Act, 10 U.S.C. 52667.

4. PRODUCTION FACILITIES AND EQUIPMENT

(a) Use

The Government may provide Users use of Government property on a non-interference basis. Cost for this use shall be assessed pursuant to FAR 52.245-9, "Use and Charges", or on a direct cost (maintenance) basis. In the event the User elects the direct cost method the system used to collect costs and account for government property must be acceptable to the cognizant contract administration office. The cognizant contract administration office is the focal point for coordinating use of DOD-owned production equipment at a contractor's plant.

(b) Disposition

It has been determined that the sale of surplus ELV production equipment to a non-ELV industry is not in the best interest of the Government because it would result in the loss of the production base for that ELV. A waiver (para. 3.F. above) has been approved allowing the sale of surplus equipment directly to a User. Said disposition shall be consistent with Public Law. Requests for the equipment will be evaluated on a case-by-case basis.

5. PROPELLANTS/FUELS

(a) Limited quantities of the following commodities are available for use by Users with the outlined restrictions: - TBD -

(b) Safety procedures and requirements for the handling and transportation of propellants/fuels will be identical to those currently utilized by the Center on which propellants/fuels are being handled, transported or used. The applicable Range Safety Office must review and approve all of these procedures.

(c) Prior to the sale of any propellants/fuels to Users, DOD shall ensure a sufficient quantity of the commodity is available at both east and west coast storage facilities to support the stockpile storage requirements. Prices for commodities will be determined by the "stock fund" price in effect when the commodities are required.

6. AIR TRANSPORTATION SERVICES

(a) The Government may make available to the User aircraft for the transportation of User's launch vehicle and associate hardware to ESMC or WSMC. The User will process requests for Air Force Special Assignment Airlift Missions (SAAM) in compliance with attachment 5 and 6 of AFR 76-38.

(b) Loading equipment will meet Air Force transportability requirements of military specifications, MIL-A-8421F. Cargo loading requirements will be in compliance with appropriate Technical Order (TO).

7. ESMC AND WSMC LAUNCH SERVICES

(a) Users shall interface with AFSC for launch and range support. At VAFB, WSMC will function as single point of contact and coordinate host base support with 1 STRAD. At the Eastern Test Range, ESMC will function as the single point of contact.

(b) Annex A for ESMC Support and Annex B for WSMC Support outline the launch and range services provided by the Government to facilitate Users once at the respective launch sites.

8. PAYLOAD PROCESSING SERVICES

Payload processing services availability will be provided on a space available, non-interference basis. Annex A for ESMC and Annex B for WSMC support outline the payload processing services provided by the Government to facilitate Users once at the respective launch sites.

9. PUBLIC AFFAIRS

(a) The SAMTO Public Affairs office (SAMTO/PA) representing WSMC and the ESMC Public Affairs office (ESMC/PA) agree to provide any requested assistance in formulating and releasing news information about Air Force support of commercial ventures to include news releases, prearranged media tours or launch observations, and news conferences. The User's news releases will be coordinated with SAMTO/PA or ESMC/PA before the event.

(b) The User will designate an on-site representative who will act as a spokesperson in all of its dealings with the media regarding all operations at WSMC and ESMC. The User will abide by all orders of the Center/Base Commander concerning media access to WSMC/ESMC.

(c) The User will notify SAMTO/PA or ESMC/PA of the times and dates of all launches. The User will notify the Center Commander or his designee and SAMTO/PA or ESMC/PA 90 days prior to the date of any launch. This notification will provide the date, time, and type of launch to be accomplished. The User shall advise SAMTO/PA or ESMC/PA of any schedule or other launch changes.

(d) Prior to any launch to be conducted pursuant to this Agreement, the User will prepare and deliver to the Center Commander and SAMTO or ESMC/PA the following news releases:

1. Fact Sheet. The fact sheet is to be provided to WSMC/ESMC and kept updated by the User to provide a description of the User's organization and functions, a general description of the User operations conducted at VAFB/CCAFS, the goals of the launches to be conducted, and the identity of the current spokesperson for the User.

2. Launch News Release. The launch news release consists of a news story to be provided to the local media prior to any launch. As a minimum, the launch release shall include a description of the launch to be conducted, the

scheduled time of the launch, and a description in general terms of the payload being launched. The launch news release must be delivered at least 20 days prior to the scheduled launch.

(e) It is understood that the Base Commander or his designee has complete control over admitting or excluding persons and property from WSMC/ESMC. This control extends to and encompasses access to WSMC/ESMC by the media. Any newsperson granted admission to WSMC or ESMC will be under the control of or be escorted by authorized User or WSMC/ESMC personnel and will not be permitted access to WSMC/ESMC without prior approval of SAMTO/PA or ESMC/PA.

(f) In the event the Government elects to utilize the commercial launch capability herein for launch of classified payloads, news releases will be approved and/or released by the cognizant Government Public Affairs Office.

(g) SAMTO/PA will coordinate all news releases and media visits with 1STRAD/PA in accordance with AFR 11-4, Attachment 2, paragraph 3.

(h) The User agrees not to use the Air Force's furnishing of goods and services under this agreement or the Air Force's sponsorship of the User onto the ESMC or WSMC ranges as a stated or implied endorsement of the User's products or services by the Air Force or DOD.

ANNEX A

TO THE

EXPENDABLE LAUNCH VEHICLE
COMMERCIALIZATION AGREEMENT

EASTERN SPACE AND MISSILE CENTER SUPPORT

January 1988 (Rev)

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APPENDICES A, B AND C TO ANNEX A

Note: The following appendices represent property and services that are available to the USER. It is the intent of the USER and GOVERNMENT that subsequent to the signing of this agreement the USER and GOVERNMENT will establish a specific list of property and services to be provided and an estimated cost to the USER. At that time the appendices will be amended (by a formal amendment to this agreement) to specifically list property and services to be provided and the total estimated cost.

ANNEX A

EASTERN SPACE AND MISSILE CENTER

(ESMC)

PART I - Services and Supplies To Be Furnished.

A. ESMC agrees to make the facilities listed in Appendix "A" available to the USER to support commercial launch vehicles. The existing equipment as listed on Air Force Property Records in these facilities shall be made available to the USER. Additional property (Equipment) may be made available to the USER upon written request to and approval by the commander or designee.

B. Subject to applicable Joint Operating Procedures, the user shall repair any Government property that becomes damaged or otherwise unserviceable while in the USER's possession. ESMC reserves the right to identify repairs required. Such repair will be at the USER's expense. Any repair or modification of the property furnished shall not detract from its intended use.

C. The GOVERNMENT will define and identify any known hazardous conditions or configurations to the USER at the time equipment or facilities are furnished. At the time of exchange, an agreement will be reached between the GOVERNMENT and USER as to who will be responsible for rectifying all identified hazardous conditions with a time schedule based on the beneficial occupancy date or possession by the USER.

D. The ESMC property furnished to the USER shall be used exclusively for launches to be performed pursuant to this Agreement.

E. ESMC agrees to make the support and services listed under Appendix "B" and "C" available to the USER to support the commercial launch program.

F. The USER will provide a critique of launch services provided and will identify any anomaly that may occur during launch operation. ESMC will reply within 60 days as to corrective actions warranted. ESMC is not obligated to take any specific action.

PART II - Joint Use

To be determined

PART III - Performance at or from Cape Canaveral Air Force Station (CCAFS)

A. RANGE SAFETY

(1) The USER shall comply with the requirements and provisions of ESMCR's 127-1, 160-1, 136-1, 127-B and AFR 127-100, as well as applicable AFOSH and other DoD, Air Force, Federal and/or State regulations as applicable as determined by the Center Safety Office unless specific waivers are granted by the ESMC Commander or his designated representative.

(2) The USER shall allow ESMC Commander's safety representatives access to all facilities being utilized by the USER under the provision of this agreement: to written hazardous operating and/or emergency procedures used in the performance of his work; and to design data and specifications on all components, systems, sub-systems, stages, complete launch vehicles and/or payloads stored, handled, tested, assembled, checked out, used or launched from ESMC. The USER will submit to the Center Safety Office all operating and/or emergency procedures deemed by either the USER or GOVERNMENT to involve hazardous materials and/or operations for review and approval. Access to facilities, data or hardware will be limited to the purpose of confirming the USER's compliance with this safety provision and the safety requirements set forth in the article entitled Safety and Accident Prevention. Data will be protected as set forth in the article entitled Information Disclosure.

(3) The USER shall verbally inform the Center Safety Office of any accident involving injury to personnel, damage to Government equipment or other range user's equipment, the general public or foreign land masses or personnel immediately (within 2 hours) of the occurrence. This shall be followed-up with a formal written incident report within 72 hours of the incident/accident. The ESMC Commander may, at his discretion, formally investigate the accident/incident. The USER shall provide complete assistance during this investigation and immediately take those corrective actions specified by the Commander as a result of the accident/incident investigation.

(4) The USER agrees that the Government safety representatives have the authority and responsibility to stop any imminent danger situation or any situation deemed to be in violation of Safety provisions contained in the referenced Range Safety regulations or any other legally applicable regulations. The USER agrees to instruct all of his personnel regarding the Government safety representative's authority and responsibility. This authority and responsibility is spelled out in detail in ESMCR 127-1, Chapters 2, 3, 4 and 5.

(5) Request for waivers to ESMC safety regulations shall be submitted in accordance with paragraph 1.5.13 of ESMCR 127-1. The Government recognizes that various systems and programs will require tailoring of specific ESMC Range Safety requirements. For example: an all solid propellant launch vehicle would not be designed to meet liquid propellant system requirements. This type of tailoring is not considered a waiver process and is normally accomplished during the conceptual and critical design review phases of the program.

(6) The USER shall develop a structured approach for presenting to Range Safety all of the necessary hardware specifications and design information on systems, procedures, operational tests and flow plans, required to meet the requirements of ESMCR 127-1. Normally this can be accomplished through a set of preliminary and critical design reviews with the goal of obtaining the required Range Safety approvals listed under paragraph 1.5.12 of ESMCR 127-1. The scope of these reviews will be limited to the purpose of confirming the USER's compliance with safety requirements set forth herein or in the article entitled Safety and Accident Prevention.

B. The USER shall comply with fire prevention and protection provisions of ESMCR 92-1, and ESMCR 127-1, for any work to be performed at CCAFS and off base areas under the jurisdiction of ESMC.

C. The USER shall document all requirements for Government support utilizing the Universal Documentation System as described in ESMCR 80-2.

D. The USER shall comply with the provisions of Cape Canaveral AFS Disaster Preparedness Plan 355-1 and the Eastern Test Range (ETR) Hurricane Plan.

E. The USER shall comply with the provisions of ETR OPLAN 19-1, Oil and Hazardous Material Spill Contingency Plan.

F. Scheduling of range resources shall be in accordance with DoD Directive 3200.11, AFR 80-28, and appropriate ESMC scheduling regulation.

G. Anytime the GOVERNMENT provides to the USER Government property for his exclusive use, the USER agrees to comply with the provisions of Federal Acquisition Regulation 45.5 (Management of Government Property in the Possession of Contractors).

H. Authorization to use the CCAFS Skid Strip for Aircraft Activities both military (SAAM) and private must obtain Prior Permission Required (PPR) approval. Operators obtain PPR approval through the Range Scheduling Division. In addition, commercial operator's military flights must operate in accordance with AFR 55-20.

PART IV. Environmental Liability and Hazardous Waste Disposition

A. ENVIRONMENTAL QUALITY

The term "environmental quality" means the quality of the air, water including ground water and surface water, whether or not such water is considered waters of the United States under the Federal Water Pollution Control Act, land, and any other regulated or protected medium or species of animal or vegetation. The State of Florida regulation of Environmental Quality may include but is not necessarily limited to statutes ordinances, rules, regulations, standards or orders relating or dealing with air quality, water quality, solid waste including but not limited to generation, transportation, treatment, storage, and disposal of hazardous waste, endangered species, historic preservation, occupational safety and health, as promulgated in the State of Florida by the Department of Environmental Regulation (DER), Department of Community Affairs, Department of Natural Resources (DNR), Water Management Districts, Game and Fresh Water Fish Commission, Department of Health and Rehabilitation Services, local pollution control programs if any, and the Bureau of Historic Preservation. Federal Regulations would include those of the Environmental Protection Agency, Occupational Safety and Health Administration, the U.S. Department of Interior, and the U.S. Army Corps of Engineers.

B. GENERAL

(1) USER agrees to conduct all operations and to maintain all equipment, at all times in complete compliance with all applicable federal, state, regional or local statutes, ordinances, rules, regulations, standards or orders relating to environmental quality, including those in existence at commencement of this Agreement, those enacted during the term of this Agreement

and Amendments to either. USER shall, at its sole expense, conduct any monitoring and prepare and submit any reports thereunder for all facilities and operations used solely by the USER.

(2) ESMC agrees to provide services to USER in a manner which complies with all applicable Federal, State, regional, local and facility environmental statutes, ordinances, rules or regulations. USER shall not be required to pay any portion of the expenses which ESMC incurred or should have incurred for bringing joint operations and facilities into compliance with environmental requirements.

C. PERMITS

(1) Where the facility or operation is to be used solely by USER, USER shall, at its sole expense, maintain in full force and effect, and fully comply with (including preparing and submitting any studies or reports required by) all Federal, State, regional, or local permits or license as may be required under applicable statutes, ordinances, rules, regulations, orders and standards relating to environmental quality for the operations and activities covered by this Agreement. USER shall not accept issuance of any permit or license which purports to impose upon GOVERNMENT any obligation or liability for any operations or activities covered by such permit or license except upon the prior written consent of GOVERNMENT. USER shall furnish to GOVERNMENT, upon request, true copies of any permits or license issued by any federal, state, regional, or local agency under any statute, ordinance, rule, regulation, order or standard relating to environmental quality.

(2) Further, USER shall review with GOVERNMENT all existing permits and licenses for any facilities, use of which is in any way involved in the operations and activities covered by this Agreement or at which any of said operations or activities will take place. USER shall take no action in violation of any term or condition of any such existing permit. Upon notice from the Government or any other agency with jurisdiction, USER shall immediately cease and desist from any action which constitutes a violation of any existing permit, except as authorized in subparagraph E below.

(3) In the event a facility or operation is to be jointly used by GOVERNMENT and USER:

(a) USER shall timely pay a pro rata share of all environmental permitting direct costs which are reasonable, necessary and allocable to USER's commercial launches; however, USER shall not obtain permits, nor shall USER pay any portion of permitting expenses which GOVERNMENT incurs, in order to remedy GOVERNMENT's existing noncompliant operation or equipment.

(b) USER shall be allowed to conduct its commercial launch operations under the aegis of any existing or future permits obtained by GOVERNMENT. However, USER shall bear the full direct cost for obtaining modifications required solely to amend any existing GOVERNMENT permits to accommodate USER's operations.

(c) USER agrees to furnish copies of all environmental permits and licenses in USER's possession which pertain to commercial launch activities at CCAFS. Likewise, ESMC agrees to provide copies of all

environmental permits and licenses associated with any service or equipment provided to USER for USER's commercial launch activities.

D. GOVERNMENT PROPERTY

(1) When Government property is jointly used by GOVERNMENT and USER for launch operations:

(a) USER shall timely pay a pro rata share of all repair, modification, or refurbishment direct costs which are reasonable, necessary, and allocable to User's commercial launches; however, USER shall not remedy or pay to remedy any noncompliance of environmental or safety laws and regulations which exists at ESMC prior to User's first commercial launch. GOVERNMENT shall use due diligence to timely effect the repair, modification or refurbishment of GOVERNMENT equipment not allocable to USER so as to minimize the effect upon USER's operations.

(b) If required, permits for repairs, refurbishment, or modifications shall be obtained consistent with paragraphs VI.A. of the Agreement and paragraph IV.C. of this Annex.

(2) Installation of or modifications to equipment owned or solely operated by or practices used by USER in the performance of this contract shall be made by USER at User's sole expense if such installation or modification is necessary for compliance with statutes, ordinances, rules, regulations, standards or orders relating to environmental quality.

E. CHALLENGES TO APPLICABILITY OF REGULATIONS

USER shall have the right to contest by appropriate administrative or legal proceedings diligently conducted in good faith, at USER's expense, the validity, application or meaning of any statute, ordinance, rule, regulation, standard, or order relating to environmental quality, subject to the following:

If, by the terms of any such statute, ordinance, rule, regulation, standard or order compliance therewith pending the prosecution of any such proceedings may legally be delayed without the incurrence of any charge or liability of any kind against GOVERNMENT, USER may delay compliance therewith until final determination of such proceedings. If any charge or liability would be incurred against GOVERNMENT by reason of such delay, USER nevertheless on the prior written consent of GOVERNMENT (such consent not to be unreasonably withheld) may contest and delay compliance with such law or regulation, provided that USER furnished GOVERNMENT security, reasonably satisfactory to GOVERNMENT, against any loss or injury by reason of such contest or delay. GOVERNMENT agrees to cooperate to the extent necessary to permit USER to contest the validity of application of any such law or regulation.

F. ENVIRONMENTAL INCIDENTS

(1) In furtherance of, but not by way of limitation of, the preceding provisions, in the event of any discharge, including any emitting, leaking, spilling, or other release to the environment of any solid, liquid or gaseous matter in violation of any statute, ordinance, rule, regulation,

standard, or order relating to environmental quality, or of any permit issued to USER or GOVERNMENT, which discharge occurs as a result of the performance of this Agreement by USER, its agents, servants, employees or subcontractors, USER shall immediately take all possible actions to stop such discharge or to restrict such discharge to legally permissible limits. The USER shall notify the GOVERNMENT of the incidents in accordance with ETR OPLAN 19-1.

(2) Expenses incurred by either USER or GOVERNMENT in actions to stop or restrict such aforementioned discharge shall be apportioned and reimbursed as between Government and USER based on degree of fault. However, expenses or liability caused by the Government's employees or its contractor's personnel while they are conducting particular activities on behalf of the User's commercial operations shall be deemed those of the USER. Nothing herein shall limit rights that either Government or USER may have against other persons, including but not limited to the contractors, agents and employees of either of them.

(3) USER shall not be responsible for any soil, surface water or groundwater contamination, contamination of facilities, appurtenances or equipment, or any personal injury, property damage, or injury to natural resources or the environment at, on, under or around the Launch Site and caused by the operations of the Government not associated with User's commercial operations; provided however, that USER shall be responsible for such personal injury, property damage and environmental damage as is caused by USER.

G. HAZARDOUS WASTE RESPONSIBILITY

1) Without limiting any of the foregoing provisions, USER agrees that during the performance of this agreement, and while the USER is using facilities (shared or dedicated) provided under this Agreement, that USER is the operator of all such facilities the operation or use of which is covered by this Agreement. USER agrees that during the performance of this Agreement and while the USER is using facilities (shared or dedicated) provided under this Agreement, that GOVERNMENT is neither the operator of such facilities nor the generator of any waste generated in conjunction with USER's activities. The foregoing applies regardless of whose employee (User's or Government's) is actually conducting particular activities on behalf of the User's commercial operations. Furthermore, USER agrees that any obligations imposed upon the "owner or operator" of a facility by any federal, state, regional, or local law, ordinance or regulation shall be fully and exclusively borne by USER, to the complete exclusion of GOVERNMENT. To the extent that either party is required to pay expenses, damages, penalties, service charges, etc., which are properly the responsibility of the other party under this paragraph, that party shall be promptly reimbursed by the responsible party. The terms of this paragraph are specifically, but not exclusively, intended to address the respective rights, duties and obligations of the parties arising out of the generation, treatment, transportation, storage or disposal of hazardous material or waste. To the extent that a court or administrative tribunal shall not withstanding the foregoing, find the GOVERNMENT wholly or partially responsible under the circumstances for activities which are infurtherance of the User's enterprise, the USER shall reimburse the GOVERNMENT for all expenses of compliance and penalties.

(2) Should GOVERNMENT exercise control (for purposes of treatment, storage, and disposal) over any hazardous or solid waste generated by USER, title to the waste shall pass to the GOVERNMENT when GOVERNMENT or its contractor takes possession of the waste. USER shall then have no liability for such waste unless USER intentionally or negligently misidentified, mischaracterized, or miscontainerized, such hazardous waste, in which event USER shall be solely liable for damages, costs of disposal, and fines and penalties with respect to the same.

(3) USER shall be allowed reasonable access to test, monitor, or sample all Government property, real or personal, placed under User's control or near User's operations, to establish environmental damage, if any, existing prior to, during, and after User's commercial launch operation. User retains exclusive title to such data and samples, but will provide GOVERNMENT copies of all test results.

(4) For purposes of establishing liability for damage caused by rocket fuels or oxidizers, control and title of such materials shall be deemed to pass to the USER when such materials are completely contained in the Ready Storage Vessel (RSV) or comparable container located on the User's launch complex.

PART V. Security

A. The USER shall comply with Air Force Regulations 125-14 and 125-15 and supplements, in connection with motor vehicle control program while performing on the base. The USER shall hold such valid licenses, insurance, permits or bonds as required, covering its vehicle, equipment and personnel. The USER shall ensure that all such items are in safe mechanical condition and that they meet the required safety inspection in accordance with the State of Florida Highway Codes and base inspection Policies.

B. The USER shall participate in the Resources Protection Program at CCAFS by complying with appropriate portions of the ETR Resources Protection Plan (OPLAN 125-37) and AFR 125-37, as supplemented.

C. Certain ESMC launch complexes may be considered critical National Resources; therefore, the USER may be required to comply with the Draft Air Force Regulation 207-7, Space Launch System Security Standard, physical security requirements, if applicable.

D. The Eastern Test Range O&M Contractor will be the single source for providing security force manpower to satisfy all physical security requirements for commercial launches from CCAFS.

PART VI. Administration

The ESMC Directorate of Plans, Programs and Requirements (ESMC/XR) at Patrick Air Force Base, Florida, is responsible for administrative management of this annex. ESMC/XR will coordinate reviews/revisions, obtain approvals and make distribution. When corresponding with the DPR for this annex, provide an information copy to ESMC/XR.

APPENDIX "A" TO ANNEX A

PROPERTY ASSIGNED EXCLUSIVELY TO

THE USER

- TBD -

ESMC will provide maintenance of all assigned facilities, including utilities, as shown in Appendix "C". Reimbursement for maintenance services will be in accordance with the applicable sections of this agreement. Interfaces will be Per Joint Operating Procedures (JOP's) in accordance with ESMC Regulation 11-3 to delineate responsibilities between ESMC and the USER.

APPENDIX "B" TO ANNEX A

LAUNCH SUPPORT

As required, ESMC will provide the following support as called out in the Program Requirements Document and addressed in the Program Support Plan for tests and launch to include:

1. Range Safety Function
 - A. Flight Termination Stations
 - B. Flight Termination Checks/Functions
 - C. Flight Safety Function to Include:
 1. Flight Monitoring
 2. Analysis of the contractor Trajectory Data
 3. Coordination for Overflight of Foreign Territories, etc.
2. Communications
 - A. Mission Communications System/Point-to-Point Telephones (Green Phones) and Mission Operations Communication System (MOCS)
 - B. Data Circuits - Local and Downrange
 - C. Operational TV (OTV - CCTV)
 - D. Timing/Sequencer/Countdown
3. Optics
 - A. Engineering Sequential
 - B. Documentary
 - C. Metric Photography
4. Meteorology
 - A. Forecast
 - B. Observations (Pressure, Temperature, Winds, and Humidity)
 - C. Balloon Data (Windsonde, Jimsphere, and Rawinsonde)

5. Metric - C-Band Beacon
 - A. Radar
 - B. Position, Velocity and Acceleration
 - C. Orbital Parameters
 - D. Vacuum Impact Point
6. Telemetry
 - A. Range TM Stations
 - B. Advanced Range Instrumented Aircraft (ARIA)
 - C. Reception and Recording of Data
 - D. Retransmission of Downrange Data
 - E. Mark Event Reporting
7. Data Processing/Flight Evaluation - reduced upper-wind data in near real time by computer-to-computer transmission for use in wind-load computations. Computation of the Standard Orbital Parameter Message (SOPM) and the Trans-orbit, assuming a nominal second burn. When requested, a Best Estimate of Trajectory (BET) will be provided. Data Reduction Delivery and Disposition - By request only
8. Telemetry Measurement and Data - Downrange Stations and Mobile (ARIA) will receive and record telemetry data during their respective view periods. Original telemetry magnetic tapes recorded at ESMC stations will be provided to the user. Magnetic tapes recorded downrange during flight will be shipped via routine commercial or range mail routes. Certain vehicle mark events will be assigned for ESMC reporting. Verbal reports will be made as the events occur.
9. Central Control Operations
10. Mission Support Planning

APPENDIX "C" TO ANNEX A

RANGE SERVICES

ESMC will provide upon the request of the USER, as a minimum, the following services and supplies for the commercial space program. These and other available services will be provided in accordance with provisions of ESMC Regulation 11-24, Authorized Support Card System.

- A. Administrative Supplies and Equipment
- B. Maintenance-Type Supplies
- C. Consumables
- D. Liquids and Compounds
- E. Machine, Electrical, Carpenter and Miscellaneous Shop Services
- F. Cape Security, including Security Police and Badge Control
- G. Fire Department Services
- H. Administrative Telephone Communication Services, including Switchboard and Telephone Installation
- I. Heavy Equipment and Material handling Operations - Provide support for test operations, including cranes, lifts, trucks, slings, and transfer of material, and equipment including furniture movement and relocation
- J. Cafeterias and Vending Machines
- K. Photography
- L. Chemical Analysis Laboratory
- M. Calibration of the Contractor Reference Standards
- N. Ordnance Storage and Handling including (EHT) Facility Usage
- O. Range Scheduling
- P. Pad Safety Support
- Q. Range Safety
- R. Maintain User Assigned Facilities and Utilities per JOP's to include:

Potable water systems
 Sewage systems
 Custodial services
 Heating and air-conditioning systems
 Warning/alarm systems
 Roads and grounds
 Steam power
 Electric power
 Garbage and trash collection
 insect and vermin control

- S. Demineralized Water
- T. Loan of Electronic and Physical Dimensional Test Equipment
- U. Skid Strip and Port Facilities
- V. Instrument Calibration and Repair
- W. Geodetic Survey
- X. Motor Vehicle Fuels, Oils, and Lubricants (POL) and Service Station
- Y. Range Engineering or Instrumentation Engineering Services Assistance as required
- Z. Facilities Engineering Services Assistance as required
- AA. Mail Service
- AB. Pad Deluge Water
- AC. Gaseous Nitrogen Pipeline Support
- AD. Propellants Logistics (Including Emergency Hazardous Waste Handling)
- AE. Electro Magnetic Measurements and Analysis
- AF. Nondestructive Testing and Leak Detection
- AG. Emergency Medical Response
- AH. Environmental Health Monitoring, Surveys and Emergency Support

ANNEX B

TO THE

EXPENDABLE LAUNCH VEHICLE
COMMERCIALIZATION AGREEMENT

WESTERN SPACE AND MISSILE CENTER SUPPORT

JANUARY 1988

WSMC ANNEX TO COMMERCIAL ELV AGREEMENT

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WSMC ANNEX TO COMMERCIAL ELV AGREEMENT

PART I. SERVICES AND SUPPLIES TO BE FURNISHED

A. To support commercial launch vehicles, WSMC agrees to, or to arrange for the host base to, make available to the USER the facilities and support services located at Vandenberg AFB, California, as listed in Appendices A, B and C. The existing equipment in these facilities, as listed on Air Force property records, shall be made available to the USER. Additional property (equipment) may be made available to the USER upon written request to and approval by the Commander or designee. The GOVERNMENT's commitment is subject to the continued existence and availability of the listed facilities and services.

B. The USER shall repair or replace any GOVERNMENT property that becomes damaged or otherwise unserviceable while in the USER's possession. Such repair or replacement will be at the USER's expense. Parts to support the repair for facility items will be provided via the normal GOVERNMENT spares support system at USER's expense or equivalent parts that meet specifications and standards procured commercially. Parts supplied for commercial launch operators will be controlled under an Air Force inventory control system to insure GOVERNMENT/commercial parts control. Any repair or modification of the property furnished shall not detract from intended use. Pertinent documentation changes will be made by the USER to reflect current configuration.

C. The WSMC property furnished to the USER shall be used exclusively for the launches to be performed pursuant to this Agreement.

D. The USER will provide a critique of launch services provided by WSMC and will identify any problem areas regarding WSMC-provided services and supplies. WSMC will reply within 60 days if corrective actions are required; however, WSMC is not obligated to take any specific corrective actions.

E. The GOVERNMENT will define and identify any known hazardous conditions or configurations to the USER at the time equipment or facilities are furnished. At the time of exchange, an agreement will be reached between the GOVERNMENT and USER as to who will be responsible for rectifying all identified hazardous conditions with a time schedule based on the beneficial occupancy date or possession by the USER.

F. The USER shall submit siting requests, plan, and specifications to the ACO for approval prior to starting any work on real property. Upon completion of repairs or modifications, as-builts shall be provided.

PART II. USE OF WSMC FACILITIES AND SERVICES

A. The USER is granted use of the US GOVERNMENT facilities as listed in Appendix A. Routine facility maintenance, utilities, and maintenance of utility systems will be provided by the GOVERNMENT with the use of the facility. Utilities include potable water, electrical power, etc. maintenance of water, electrical power systems, sewers, roads and grounds, and structural repairs required because of normal wear and tear, will be provided by the GOVERNMENT. The GOVERNMENT will provide the above services only if there are adequate

appropriated funds available to perform the necessary tasks. A list of available WSMC services required to support payload operations is also provided in Appendix A. operational and maintenance interface will be per Joint Operations Procedures (JOP) in accordance with WSMC Regulation 11-8 to delineate responsibilities between WSMC and the USER for facilities, equipment, and services.

B. Joint Use of Facilities to be determined

C. Anytime the GOVERNMENT provides a USER GOVERNMENT property for its exclusive use, the USER agrees to comply with the provisions of FAR 45.5 (management of GOVERNMENT property in the possession of contractors).

PART III. PERFORMANCE AT VANDENBERG AFB

A. Range Safety

1. The USER shall comply with the requirements and provisions of WSMCR 127-1, ISTRADR 127-200 and VAFBR 127-XX as well as applicable AFOSH and other DOD AF, Federal, and/or State regulations as applicable as determined by the Center Safety Office unless specific waivers are granted by the Commander or his designated representative while Performing within the boundaries of Vandenberg AFB and the Western Test Range (WTR). In the event that those safety regulations are revised, the USER is required to comply with the revised regulations according to their terms. The USER may request a waiver of such compliance from WSMC as to those regulations over which WSMC has waiver authority. Any requests for waiver of higher level military regulations shall be submitted through WSMC. Request for waiver shall state the basis for the request and substantiate how safety can nevertheless be maintained while operating under the waiver.

2. The USER shall comply with fire prevention and protection provisions of VAFBR 92-1 for any work to be performed at VAFB and off-base areas under the jurisdiction of WSMC.

3. The USER shall allow WSMC Commander's safety representatives access to all facilities being utilized by the USER under the provision of this agreement; to written hazardous operating and/or emergency procedures used in the performance of his work; and WSMC Commander retains the right for his safety representative to access design data and specifications on all components, systems, sub-systems, stages, complete launch vehicles and/or payloads stored, handled, tested, assembled, checked out, used, or launched from WSMC for safety evaluation or accident prevention. The USER will submit to the Center Safety Office all operating and/or emergency procedures deemed by either the USER or GOVERNMENT to involve hazardous materials and/or operations for review and approval. Access to facilities, data or hardware will be limited to the purpose of confirming the USER's compliance with this safety provision and the safety requirements set forth in the article entitled Safety and Accident Prevention. Data will be Protected as set forth in the article entitled Information Disclosure.

4. The Center Commander may assign such GOVERNMENT or GOVERNMENT contractor safety personnel as he deems necessary to observe operations by the USER. In the event of any accident involving damages to GOVERNMENT facilities and/or equipment, the applicable Launch Site Commander reserves the right to conduct a complete investigation into the events surrounding the mishap. The USER personnel will support this investigation to the extent deemed necessary by the Commander, and the USER will provide access to all internal documents and their own investigation report, as well as to all personnel who may have relevant information.

5. In performing work under this contract, the USER shall conform to the specific safety requirements contained in this contract, and the applicable safety rules prescribed in AFR 127 and ESMCR/WSMCR 127 series, applicable Pad Safety Plans and Standard operating Procedures (SOPs), specific Air Force Occupational Safety and Health (AFOSH) Standards/Regulations, and AF Explosive Safety Regulations developed in accordance with AFR 127-12, as they now exist and as they may subsequently be modified and/or supplemented. The USER agrees to take all reasonable steps and precautions to prevent accidents and preserve the life and health of the USER, GOVERNMENT, and operating contractor personnel performing or in any way coming in contact with the performance of this contract on such premises. Any violation of such rules and requirements, unless promptly corrected as directed by the GOVERNMENT, shall be grounds for temporary suspension of work until imminent danger conditions are corrected, and may ultimately be grounds for termination of this contract. The GOVERNMENT may, by written order, direct additional safety and accident standards as may be required on the performance of this contract and any such adjustments resulting from such direction will be in accordance with this provision of the contract.

B. The USER shall document all requirements for GOVERNMENT support utilizing the Universal Documentation System as described in the WSMC WTR Range USERs Handbook.

C. The USER is responsible for insuring that any supplies and support purchased for use in GOVERNMENT-sponsored programs, including bench stock and raw materials, are not used for the commercial operation. Adequate inventory control procedures will be instituted to insure compliance.

D. The USER will participate in the environmental protection effort at Vandenberg AFB by complying with the requirements of AFR 19-1, AFR 19-2, and AFR 19-7.

E. The USER shall participate in Joint Pacific Area Scheduling Office (JPASO) scheduling activities and provide WSMC Scheduling with the requested launch date for the USER operation. WSMC shall have the right to specify the launch date that is acceptable to the WTR in accordance with established Range Scheduling Practices.

F. The USER shall comply with the requirements of AFR 122-1&, BMD Supplement 1 to AFR 122-16, WSMC Supplement 1 to AFR 122-1&, and VAFBR 1&1-1 for payloads involving radioactive materials while performing within the boundaries of Vandenberg AFB and the Western Test Range. The USER shall establish a radiation protection program to insure that all radioactive materials are handled in accordance with Nuclear Regulatory Commission

regulations and guidelines and an acceptable As Low As Reasonably Achievable (ALARA) program, is enforced.

G. The USER shall notify Spaceport Management (4392 AEROSG/OT) of contract or other aircraft scheduled to use Vandenberg airfield facilities in support of their activities. Make notification no later than two weeks in advance; include arrival/departure times, support requirements, and local point of contact. In addition, commercial operations at military landing fields must be in accordance with AFR 55 20.

H. GOVERNMENT Access.

1. From time to time, the Center Commander, or designee, will appoint in writing (with a copy to the USER) selected personnel to act as official Center observers. These individuals shall have access to all GOVERNMENT property being used by the USER at the Center. These individuals will provide a written report to the USER within 48 hours if there are any observations and findings on such visits.

2. At all times, Center personnel and other Center sponsored GOVERNMENT personnel, to include fire, security, medical, environmental health, safety, or others specifically authorized by the Commander, shall have access to all property being used by the USER pursuant to this contract.

I. Permits and Responsibilities. Without expense to the GOVERNMENT, the USER shall be responsible for obtaining any Federal, State, and local operating authorities, permits, licenses, etc., necessary to perform the operations. All environmental permit submissions and meetings with regulatory agencies shall be coordinated through SD/DEC prior to submission to/meeting with the regulatory agency.

PART IV. Environmental Liability and Hazardous Waste Disposition.

A. ENVIRONMENTAL QUALITY. The term "environmental quality" means the quality of the air, water (including ground water and surface water, whether or not such water is considered waters of the United States under the Federal Water Pollution Control Act), land, and any other regulated or protected medium or species of animal or vegetation. The State of California regulation of environmental quality may include but is not necessarily limited to:

1. Air quality (e.s., those of the Santa Barbara County Air Pollution Control District, the California Air Resources Board and the United States Environmental Protection Agency (ESEPA)).

2. Water quality (e.g., those of the Central Coast Regional Water Quality Control Board, the California Division of Fish and Game, and USEPA).

3. Solid waste, including but not limited to, generation, transportation, treatment, storage, and disposal of hazardous waste (e.g., those of the USEPA, the California Department of Health Services, the California Highway Patrol, and the local health agencies).

4. Endangered species (e.g., those of the California Division of Fish and Game, U.S. Fish and Wildlife Service).

5. Historic preservation (e.g., those of the State Historic Preservation Office, the United States Department of the Interior).

6. Occupational Safety and Health. The preceding list is meant to be demonstrative, not all inclusive. Federal regulations would include those of the Environmental Protection Agency, Occupational Safety and Health Administration, and the US Department of Interior, and the US Army Corps of Engineers.

B. GENERAL.

1. USER agrees to conduct all operations and to maintain all equipment possessed by USER in a manner which complies with all applicable, relevant, and appropriate Federal, State, regional or local environmental statutes, ordinances, rules, regulations, standards or orders relating to environmental quality, including those in existence at the commencement of this Agreement, those enacted during the term of this Agreement and amendments to either. USER shall, at it's sole expense, conduct any monitoring and prepare and submit any reports required thereunder for all facilities and operations used solely by USER.

2. WSMC agrees to provide services to USER in a manner which complies with all applicable Federal, State, regional, local and facility environmental statutes, ordinances, rules or regulations. USER shall not be required to pay any portion of the expenses which WSMC incurred or should have incurred for bringing joint operations and facilities into compliance with environmental requirements.

C. PERMITS.

1. Where the facility or operation is to be used solely by USER, USER shall, at it's sole expense, obtain, maintain in full force and effect, and fully comply with (including preparing and submitting any studies or reports required by) all Federal, State, regional, or local permits or licenses as may be required under applicable statutes, ordinances, rules, regulations, orders and standards relating to environmental quality for the operations and activities covered by this Agreement. USER shall not accept issuance of any permit or license which purports to impose upon GOVERNMENT any obligation or liability for any operations or activities covered by such permit or license except upon the prior written consent of GOVERNMENT. USER shall furnish to GOVERNMENT true copies of any permits or license issued by any Federal, State, regional, or local agency under any statute, ordinance, rule, regulation, order or standard relating to environmental quality.

2. Further, USER shall review with GOVERNMENT all existing permits and licenses for any facilities use of which is in any way involved in the operations and activities covered by this Agreement or at which any of said operations or activities will take place. USER shall take no action which violates any term or condition of any such existing Permits. Upon notice from

the GOVERNMENT or any other agency with jurisdiction, USER shall immediately cease and desist from any action which constitutes a violation of any existing permit, except as authorized in subparagraph E below.

3. In the event a facility or operation is to be jointly used by GOVERNMENT and USER:

a) USER shall timely pay a pro rata share of all environmental permitting direct costs which are reasonable, necessary, and allocable to USER's commercial launches; however, USER shall not obtain permits, nor shall USER pay any portion of permitting expenses which GOVERNMENT incurs, in order to remedy GOVERNMENT's existing noncompliant operation or equipment. ||

b) USER shall be allowed to conduct its commercial launch operations under the aegis of any existing or future permits obtained by GOVERNMENT. However, USER shall bear the full direct cost for obtaining modifications required solely to amend any existing GOVERNMENT permits to accommodate USER's operations.

c) USER agrees to furnish copies of all environmental permits and licenses in USER's possession which pertain to commercial launch activities at VAFB. Likewise, WSMC agrees to provide copies of all environmental permits and licenses associated with any service or equipment provided to USER for USER's commercial launch activities.

D. GOVERNMENT PROPERTY

1. When GOVERNMENT property is jointly used by GOVERNMENT and USER for launch operations:

a) USER shall timely pay a pro rata share of all repair, modification, or refurbishment direct costs which are reasonable, necessary, and allocable to USER's commercial launches; however, USER shall not remedy or pay to remedy any noncompliance of environmental or safety laws and regulations which exists at WSMC prior to USER's first commercial launch. GOVERNMENT shall use due diligence to timely effect the repair, modification or refurbishment of GOVERNMENT equipment not allocable to USER so as to minimize the effect upon USER's operations. ||

b) If required, permits for repairs, refurbishment, or modifications shall be obtained consistent with paragraphs VI.a. of the Agreement and paragraph IV. C. of this Annex.

2. Installation of or modifications to equipment owned or solely operated by or practices used by USER in the performance of this contract shall be made by USER at USER's sole expense if such installation or modification is necessary for compliance with statutes ordinances, rules, regulations, standards or orders relating to environmental quality.

E. CHALLENGES TO APPLICABILITY OF REGULATIONS:

USER shall have the right to contest by appropriate administrative or legal proceedings diligently conducted in good faith at USER's expense, the validity, application or meaning of any statute, ordinance, rule, regulation, standard, or order relating to environmental quality, subject to the followings:

If, by the terms of any such statute, ordinance, rule, regulation, standard or order compliance therewith pending the prosecution of any such proceedings may legally be delayed without the incurrance of any charge of liability of any kind against GOVERNMENT, USER may delay compliance therewith until final determination of such proceedings. If any change or liability would be incurred against GOVERNMENT by reason of such delay, USER nevertheless on the prior written consent of GOVERNMENT (such consent not to be unreasonably withheld) may contest and delay compliance with such law or regulation provided that USER furnished GOVERNMENT security, reasonably satisfactory to GOVERNMENT against any loss or injury by reason of such contest or delay. GOVERNMENT agrees to cooperate to the extent necessary to permit USER to contest the validity of application of any such law or regulation.

F. ENVIRONMENTAL INCIDENTS.

1. In furtherance of, but not by limitation of, the preceding provisions, in the event of any discharge, including any emitting, leaking, spilling, or other release to the environment of any solid, liquid, or gaseous matter in violation of any statute, ordinance, rule, regulation, standard, or order relating to environmental quality, or of any permit issued to USER or GOVERNMENT which discharge occurs as a result of the performance of this Agreement by USER, its agents, servants, employees or subcontractors, USER shall immediately take all possible actions to stop such discharge or to restrict such discharge to legally permissible limits. The USER shall notify the GOVERNMENT of any incidents.

2. Expenses incurred by either USER or GOVERNMENT in actions to stop or restrict such aforementioned discharge shall be apportioned and reimbursed as between GOVERNMENT and USER based on degree of fault. However expenses or liability caused by the GOVERNMENT's employees or its contractors' personnel while they are conducting particular activities on behalf of the USER's commercial operations shall be deemed those of the USER. Nothing herein shall limit rights that either GOVERNMENT or USER may have against other persons, including but not limited to the contractors, agents and employees of either of them.

3. USER shall not be responsible for any soil, surface water or groundwater contamination, contamination of facilities, appurtenances or equipment, or any personal injury, property damage, or injury to natural resources or the environment at, on, under or around the Launch Site and caused by the operations of the GOVERNMENT not associated with USER's commercial operations; provided however, that USER shall be responsible for such personal injury, property damage and environmental damage as is caused by USER.

G. HAZARDOUS WASTE RESPONSIBILITY.

1. Without limiting any of the foregoing provisions, USER agrees that during the performance of this Agreement, and as between the parties, and while the USER is using facilities (shared or dedicated) provided under this

agreement, that USER is the operator of all such facilities the operation or use of which is covered by this Agreement. USER agrees that during the performance of this Agreement and while the USER is using facilities (shared or dedicated) provided under this Agreement, that GOVERNMENT is neither the operator of such facilities nor the generator of any waste generated in conjunction with USER's activities. The foregoing applies regardless of whose employee (USER's or GOVERNMENT's) is actually conducting particular activities on behalf of the USER's commercial operations. Furthermore, USER agrees that any obligations imposed upon the "owner or operator" of a facility by any Federal, State, regional, or local law, ordinance or regulation shall be fully and exclusively borne by USER, to the complete exclusion of GOVERNMENT. To the extent that either party is required to pay expenses, damages, penalties, service charges, etc, which are properly the responsibility of the other party under this paragraph, that party shall be promptly reimbursed by the responsible party. The terms of this paragraph are specifically, but not exclusively, intended to address the respective rights, duties and obligations of the parties arising out of the generation, treatment, transportation, storage or disposal of hazardous material or waste. To the extent that a court or administrative tribunal shall notwithstanding the foregoing, find the GOVERNMENT wholly or Partially responsible under the circumstances for activities which are in furtherance of the USER's enterprise, the USER shall reimburse the GOVERNMENT for all expenses of compliance and penalties.

2. Should GOVERNMENT exercise control (for purposes of treatment, storage, and disposal) over any hazardous or solid waste generated by USER, title to the waste shall pass to the GOVERNMENT when GOVERNMENT or its contractor takes possession of the waste. USER shall then have no liability for such waste unless USER intentionally or negligently misidentified, mischaracterized, or miscontainerized, such hazardous waste, in which event USER shall be solely liable for damages, costs of disposal, and fines and penalties with respect to the same. ||

3. USER shall be allowed reasonable access to test monitor, or sample all GOVERNMENT Property, real or personal. Placed under USER's control or near USER's operations, to establish environmental damage, if any, existing prior to, during, and after USER's commercial launch operation. USER retains exclusive title to such data and samples, but will provide GOVERNMENT copies of all test results.

4. For purposes of establishing liability for damage caused by rocket fuels or oxidizers, control and title of such materials shall be deemed to pass to the USER when such materials are completely contained in the Ready Storage Vessel (RSV) or comparable container located on the USER's launch complex.

PART V. Security

A. The USER shall comply with Air Force regulations 125-14 and 125-15 and supplements, in connection with motor vehicle traffic control programs while performing on the base. The USER shall hold such valid licenses, insurance, permits or bonds as required, covering its vehicles, equipment, and personnel. The USER shall insure that all such items are in safe mechanical condition and that they meet the required safety inspection in accordance with the State of California Highway codes and Base inspection policies.

B. The USER shall participate in the Resources Protection program at Vandenberg AFB complying with appropriate portions of the host base Resources Protection Plan and AFR 125-37, as supplemented.

C. Certain WSMC launch complexes may be considered critical national resources; therefore, the USER may be required to comply with the Draft Air Force Regulation 207-7, Space Launch System Security Standard, physical security requirements, if applicable.

D. The WSMC will arrange for Host Base or WTR to satisfy all physical security requirements for commercial launches from VAFB.

PART VI. ADMINISTRATION

The 6595 MTG Directorate of Plans, Programs and Requirements (6595 MTG/XR) at Vandenberg Air Force Base, California, is responsible for administrative management of this Annex. 6595 MTG/XR will coordinate reviews/revisions, obtain signatures and make distribution. When corresponding with the OPR for this Annex, provide an information copy to 6595 MTG/XR.

APPENDICES A, B, AND C TO ANNEX B

NOTE: The following appendices represent property and services that are available to the USER. It is the intent of the USER and GOVERNMENT that subsequent to the signing of this agreement the USER and GOVERNMENT will establish a specific list of property and services to be provided and an estimated cost to the USER. At that time the appendices will be amended (by a formal amendment to this Agreement) to specifically list property and service to be provided and the total estimated cost.

APPENDIX "A"
FACILITIES AND SERVICES AVAILABLE

- TBD -

APPENDIX "B"
RANGE SUPPORT SERVICES

WSMC will Provide the following support as requested in the Program Requirements Document and addressed in the Program Support Plan for tests and launch.

1. Range Safety Function
 - A. Command Destruct Stations
 - B. Command Destruct Checks/Function
 - C. Flight Safety Function to include
 1. Flight monitoring
 2. Analysis of The USER Trajectory Data
 3. Coordination for Overflight of Foreign Territories, etc
2. Communications
 - A. Transistorized Operational Phone System (TOPS)/Point-to-Point Telephones (Green Phones) and Mission Operations Communications System (MOCS)
 - B. Data Circuits Local and Downrange
 - C. Operational TV (DTV CCTV)
 - D. Timing/Sequencer/Countdown
3. Optics
 - A. Engineering Sequential
 - B. Documentary
 - C. Metric Photography
4. Meteorology
 - A. Forecast
 - B. Observations (Pressure, Temperature, Winds, and Humidity)
 - C. Balloon Data (Windsonde, Jinsphere, and Rawiasonde)
5. Metric C Band Beacon
 - A. Radar
 - B. Position, Velocity and Acceleration
 - C. Orbital Parameters
 - D. Vacuum Impact Point
6. Telemetry
 - A. Range TM Stations
 - B. Advanced Range Instrumented Aircraft (ARIA), if required.
 - C. Reception and recording of Data
 - D. Retransmission of Downrange Data
 - E. Mark Event reporting
7. Data Processing/Flight Evaluation reduced upper-wind data in near real time by computer-to-computer transmission for use in wind-load

computations. Computation of the Standard Orbital Parameter Message (SOPM) and the Trans-orbit, assuming a nominal second burn. When requested, a Best Estimate of Trajectory (BET) will be provided at additional costs.

8. Data Reduction Delivery and Disposition by request only.
9. Telemetry Measurement and Data Downrange Stations and Mobile (ARIA) will receive and record telemetry data during their respective view periods. Original telemetry magnetic tapes recorded at WSMC stations will be provided to the USER. Magnetic tapes recorded downrange during flight will be shipped via routine commercial or range mail routes. Certain vehicle mark events will be assigned for WSMC reporting. Verbal reports will be made as the events occur.
10. Central Control Operations.
11. Mission Support Planning.

APPENDIX "C"
HOST BASE SUPPORT SERVICES

The host base will provide the USER the following services and supplies for the Commercial Space Program on a noninterference basis, reasonable and consistent with SAC programs and priorities, and subject to availability.

1. Administrative Services

- o Communications Distribution Box (mail pickup provided by contractor)
- o Publications and Forms (35 different forms, includes 10 VAFB regulations)
- o Classified destruction
- o Offset printing (31,500 copies per quarter)

2. Civil Engineering Services

- o Janitorial services
- o Utilities (domestic water, electricity, sewage disposal, heating)
- o Grounds maintenance
- o Building maintenance (minor modifications, painting, general upkeep)
- o Diesel generator (only if currently available at the site)
- o Fire Protection at the launch site and as described in Appendix A.
- o Trash Pickup
- o Pest Control

Note: To be utilized on a shared basis with Air Force programs.

Note: USER shall provide and install meters for all utilities.

3. General Services

- o Cafeteria, Snack-Bars, Lunch Wagon

4. USAF Hospital Services

- o Emergency Medical Treatment
- o First aid, ambulance, hospitalization
- o Launch/Test (Medical/Hospital standby)
- o Bioenvironmental: Bioenvironmental Engineering Services (BES) will not provide routine industrial hygiene or health physics support to

contractors. Contractors must comply with Nuclear Regulatory Commission regulations and VAFBR 161-1 for industrial radiography operations on Vandenberg AFB. Bioenvironmental Engineering Services will only Provide launch/test standby has requested by ISTRAD/SE. The following support is outlined below:

- o Health Physics. The USAF Hospital Bioenvironmental Engineering Service will review NRC/State Licenses or Air Force Permits for acceptability as to the use and transport of radioactive isotopes or substances on Vandenberg AFB. Personnel monitoring (including film badges or dosimeters) facility or equipment monitoring will not be provided.
- o Industrial Hygiene. Monitoring of personnel or ambient shop environment to determine occupational exposure or review of work procedures will not be provided. Monitoring of occupational exposure control equipment/supplies will not be provided except when necessary to confirm claims of inadequate performance of GOVERNMENT furnished equipment/facilities when contractor obtained data indicates such inadequate performance.
- o Launch/Test-On Site and Hospital Standby. USAF Hospital/SDPB requires a listing of the specific operations for which this support is being requested. This support is provided when directed by existing disaster and missile hazard/ mishap plan or Air Force regulation/technical orders.

5. Office Machine Services

- o Office Machine Maintenance
 - o Manual typewriters
 - o Electric typewriters
 - o Ozalid machine
 - o Adding machines
 - o Offset duplicator
 - o Collator
 - o 3M 201 Reader/Printer
 - o Postage machine
 - o Postage scale

Note: These items are to be utilized on a shared basis with Air Force programs.

6. Operation and Training Services

- o Aircraft Landings

Note: This service to be utilized on a shared basis with Air Force programs.

7. 394 TMS Services

- o Ordnance Storage (Class A, B and C explosives)
- o Ordnance Disposal (Class B and C explosives)
- o Torque Wrench Calibration (150 - 2000 foot pound range; + or - 3% tolerance)

Notes: To be utilized on a shared basis with Air Force programs.

8. Safety Support Services

- o Launch/Test Support
- o General Safety services as currently provided under Air Force programs.

9. Security Police Services

- o Pass & ID Service
- o POV Registration
- o Visitors, Base Entry approval
- o Facility clearance required
- o Restricted Area requirements for the launch site
- o Non-nuclear Munitions Storage required
- o General Law Enforcement activities
- o Launch Support Cordon/Entry Control

Notes: To be utilized on a shared basis with Air Force programs.

10. Supply Support Services

- o H & O Store (Household and office)*
- o Other (Common/Standard Items)*
 - * Common/Standard items and H & O Store supplies to be obtained from Base Supply will include but not be limited to the following:
 - o Stationary items (including IBM and Xerox copy Paper)
 - o Tape (all types)
 - o Welding supplies
 - o Duplicating and Reproduction supplies
 - o Lubricants and greases
 - o Electrical supplies
 - o Lumber and plywood
 - o Painting supplies
 - o Packing and crating supplies
 - o Raw stock
 - o Pan stock (nuts, bolts, screws)
 - o Cleaning compounds and liquids
 - o Polyethylene (rolls and bags)
 - o Recording supplies
 - o Computer supplies (IBM System 34)
- o LN2
- o Liquid Oxygen
- o Other
 - o RP-1
 - o Gases
 - o Chemicals
 - o Lubricants
 - o Hydraulic Fluids
 - o Preservatives
- o Mogas

- o Hypergolic Fuels Storage Facilities and Tractor/Trailer Transport Systems.

Notes: Propellants will be provided only if they are available and not needed for Air Force requirements.

11. Communications Services

- o Telephone Lines (including leased lines and Message/Teletype service)

12. Transportation Service

- o Wrecker Service

CONTRACT ADMINISTRATION SERVICES

1. This Article specifies the types of in-plant Contract Administration Services (CAS) the Government will provide to users under this Agreement, and outlines the terms and conditions under which those services will be provided. To the extent that the terms and conditions for providing CAS as specified within this Article conflict with any other provision of the Agreement, this article shall govern. The Government shall not be liable, or otherwise responsible for, damages incurred by or caused by the GOVERNMENT or by the User or the User's contractors or any User or User's agents or employees resulting from Government participation in in-plant CAS including, but not limited to quality assurance.

2. Conditions under which CAS will be provided:

a. CAS will be provided at user production facilities only if the user has ongoing Government contracts at such facilities for the same or similar component items.

b. CAS will be provided only for common component items if commercial components are produced and configured similar to components coproduced for use on Government launch vehicles. The point at which particular components are considered sufficiently distinguishable will be determined by the Government and that determination will not be subject to Article IX, Disputes.

c. CAS will be provided only if requested from the GOVERNMENT in writing by the user. Such request should specifically identify services desired, the place or places of production, and the anticipated period over which the services will be needed.

(1) Approval of the request is contingent upon determinations by the Government that CAS support for the launch vehicle is (a) in the best interests of the Government and (b) sufficient resources are available to provide the requested services.

(2) CAS will normally be limited to quality assurance (QA) oversight of quality and production systems and hardware inspection, configuration management, and oversight of the user's management of government property in their possession. Additional contract administration services may be requested but should be limited to the responsibilities cited in FAR 42.302.

(3) Contract administration services will be provided at the same level and to the same extent as for launch vehicles being produced under the Government contract(s).

(4) all government approvals and procedures required under Government contracts will apply.

d. Users may request CAS support at the user's subcontractor and/or vendor production facilities, provided that the subcontractor or vendor is producing components, hardware, software, or technical data for the related Government program.

(1) The Government will make the final determination of whether CAS will be provided at a particular subcontractor or vendor using the criteria outlined in paragraphs c(1) and c(2) above.

(2) CAS will be provided for common component items only if the subcontractor or vendor is producing commercial components configured similar to those components produced for use on Government launch vehicles.

3. Reimbursement:

a. The user agrees to reimburse to Air Force on the same basis as that used for providing CAS to NASA using the rate in effect as of the date of the billing for such reimbursements. The user will be charged an amount which represents the cost of CAS for the commercial items proportional to the cost of CAS for all (commercial and Government) common components produced.

b. The user agrees that this method reasonably and accurately reflects that actual direct cost of CAS provided in support of commercial work.

APPENDIX 3



October 7, 1987
DH 87.1295

The Honorable Bill Nelson, Chairman
Subcommittee on Space Science and Applications
Committee on Science, Space and Technology
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

As a very interested member of the audience at your subcommittee's hearings of Tuesday, September 15 and Thursday, September 17, I feel it necessary to call to your attention several areas of incomplete and potentially misleading information which could result in reaching erroneous conclusions on these important issues.

The most important area is that of the threat, to both the U.S. and western Europe, posed by the Soviet Proton and Chinese Long March launch vehicles. My concern stems from the very specific comments in the testimony (for the record) of Mr. Murphy of General Electric, the implicit and explicit comments of Mr. Dorfman of Hughes Aircraft, and the flavor of some of the responses to questions at Tuesday's hearing, especially from Dr. Lovelace and Mr. Brakeen.

A recurrent theme has emerged with two main threads: there is not, or will not be in the future, adequate launch capacity in the west to meet the needs of western satellite owners and operators, and "the Europeans" may be planning to use Soviet Proton launches to assemble very attractive package deals, thereby threatening the ability of U.S. satellite builders, such as Hughes and GE, to compete for this important market segment. This "threat" has been used by both of these companies in an attempt to rationalize and justify a change in the basic U.S. policy against both technology transfer and unfair trade practices.

The second area of particular concern to me are the repeated allegations, all still totally unsubstantiated, of various forms of "subsidy" of Arianespace by either ESA or France. This issue has arisen most recently in connection with the question of the U.S. position on limits on third party liability, in which the U.S. ELV operators point to the fact that Arianespace and its customers are not required either to obtain extreme amounts of insurance or indemnify the government(s) involved in the launches. It is important to note that the historical basis for our requiring our customers to obtain 400 million French franc (equivalent) coverage is very simply that when we began writing our first commercial contracts, the only model was NASA. At that time, in the 70's, NASA required a coverage of \$100 million, the Franc was four to the dollar, and the simple arithmetic gave us 400 million francs. Under the 1973 treaty covering third party liability, the "launching states" are absolutely liable for damage to third parties caused by any space vehicle launched under their auspices. The real question is not subsidy, but risk-sharing by the private and public sectors. If the insurance is capped at \$100 million, or any other amount, no one is required to spend any money unless there is a catastrophic accident, which has never occurred.

ARIANESPACE, Inc., 1747 PENNSYLVANIA Avenue, N.W., Suite 875, WASHINGTON, D.C. 20006 • (202) 728-9075 • Telex ARIANES WSH 897006

The Honorable Bill Nelson
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October 7, 1987

The famous "level playing field", invoked so often and so readily in these discussions, is a matter of great concern to Arianespace as well as to our U.S. competitors. It should be remembered that the "rules of the road" discussions now in progress between the U.S. and European representatives are the result of an initiative on the part of Europe, arising from the TCI Section 301 petition. It is our hope that these ground rules, when mutually established and agreed upon, will form the basis for a common western position with which to confront the predatory positions of the Soviet Union and the Peoples Republic of China.

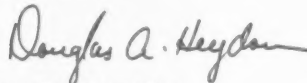
Other comments were made during the course of your hearings relative to keeping the launch business from going "offshore". This term has a very definite two way connotation, since, as Mr. Brackeen pointedly noted in his testimony, all of the new commercial launch business Martin has obtained, and much of the potential business as well, comes from foreign or "offshore" sources. From the perspective of Europe, this is business that has gone "offshore". Fair trade does not imply closed trade, and it is noteworthy that the business to which Mr. Brackeen refers is, in many cases, with governmental agencies or quasi-governmental organizations such as Intelsat and Eutelsat. The U.S. government has closed its bidding on the NOAA GOES launch services procurement to non-U.S. entities. Is this a "level playing field"?

Allegations were also made concerning "agencies of the French government supporting the competition" through offsets and financing. These allegations seem to imply that U.S. firms engaging in overseas commerce do not use offsets or Export/Import Bank financing whenever possible. Surely, this is not the case, and to allow such implications to stand unchallenged is grossly unfair. In any case, financing by the banks of either Europe or the U.S. in this area requires adequate credit capability on the part of the borrowers, and does not in any case represent financial support to the companies doing the selling of the goods or services.

Since I represent a commercial organization with a substantial stake in the results of these hearings and discussions, I would very much appreciate your consideration of these comments, and their inclusion in the record. You know from several past conversations that we are ready to discuss these, and any related issues, with you and your staff at any time. Our opinions on these subjects may differ, but I believe we both recognize the benefits and value of continuing dialog.

Thank you for your interest and attention.

Sincerely,



Douglas A. Heydon
President

DAH/wp

APPENDIX 4

MEMORANDUM FOR RECORD (In response to a question from Mr. Nelson)

SUBJECT: SHUTTLE LAUNCH SAFETY ZONE

Dr. Cook, there was a UPI story that said--this is dated February the 7th--that the Air Force is studying whether to expand a Shuttle launch safety zone. Naturally, at home this has gotten all kinds of press. It's a move that would keep reporters and other folks that would be down there watching the next Shuttle launch from the existing press site. Do you have any comments or any questions or anything that you would like to state for the record with regard to the Air Force considerations? I assume that this will ultimately be a NASA decision, not an Air Force decision. But the Air Force, as I understand it, is going to be making the recommendations. Would you shed any light on that for us?

Two key events have prompted the Air Force to reevaluate its position on the safety zone for shuttle launches. The first was the "Challenger" failure in which the solid rocket motors continue intact and in-flight following the explosion instead of breaking up as expected. The second was the failure of the Titan 34D mission at Vandenberg AFB, in November 1986, in which the large aft segment one of the solid rocket motors fell to the ground intact with propellant. The resulting impact explosion was very large and caused extensive damage to the launch facility and surrounding area. The explosive power observed in this failure would be equalled or exceeded if a shuttle rocket motor aft segment were to impact the ground. In the event of a massive failure this is highly possible since break up or range safety destruct action on a solid rocket motor leaves the aft segments intact.

Because of these experiences during the first two in-flight failures ever experienced for large segmented rocket motors in flight, the Air Force is concerned about nonessential personnel being allowed in the proximity of the launch site. If a failure occurred that drove the Shuttle over these densely populated areas there would not be any way to protect these people should a "Challenger" type disaster recur.

The Air Force Range Safety mission is to protect people and property from errant missile flights. Our method of doing this is to destroy the errant missile when it becomes a threat to the public. On past Shuttle launches we allowed an errant Shuttle to fly over populated areas as long as it was identified by NASA as being under control. "Challenger" was under control at the time of its explosion. The Air Force does not want to be placed in the situation where an errant Shuttle would be allowed to fly over highly populated areas under the belief that it was still controllable and then incur a disaster that could result in large debris and Solid Rocket Motor Aft Segment impacts and explosions, in a populated area.

Estimates show a potential for each aft segment to destroy up to five city blocks. The only way to remove this threat is to move nonessential personnel further away from the launch site to an area where the chance of a Shuttle deviating far enough off course to overfly is very small.

In defining nonessential personnel in our discussion with NASA we will be addressing the press, VIPs, non-launch involved KSC personnel, and the large groups of visitors given special access to KSC property to view the launch. Our intent is to allow the orbiter the most room to fly and provide the maximum safety available.

A key point to remember is that we want to allow the orbiter and its crew the most latitude to recover the vehicle without threat to the public. The expansion of the safety zone extends this capability. On our expendable launch vehicles we place the safety zone closer to the launch site because we destroy any errant missile before it can threaten personnel or property beyond the line. This destroys a missile that cannot achieve its mission no matter how much it recovers. On the Shuttle the crew may still have the opportunity to survive and it is essential we provide every chance possible. The Air Force will jointly work this problem with NASA analyzing the associated risks, and develop a safety criteria that provides the best option for public safety and crew survivability.

APPENDIX 5

WILLIAM D. ENGLISH
8280 Greensboro Drive
Suite 605
McLean, Virginia 22102
(703) 848-4040

December 4, 1987

Lillian M. Trippett, Esquire
Subcommittee on Space Science and Applications
Committee on Science, Space and Technology
U.S. House of Representatives
Rayburn House Office Building
Room 2324
Washington, D.C. 20515

Dear Lillian:

On behalf of Jim Barrett, President of Technology Risk Administrators (TRA), I am submitting the following comments with respect to the Discussion Draft, dated November 30, 1987, of the Commercial Space Launch Act Amendments of 1987. As you know, TRA is in the process of establishing a U.S. Launch Liability Insurance Facility to ensure availability of adequate insurance capacity on a continuing and dependable basis at reasonable cost to cover potential public liability claims and damage to Government property that may result from U.S. commercial space launch activities. It is the consensus of the insurance industry involved in commercial space activities that the establishment of such a facility would best ensure maximum insurance protection during both optimum and minimum insurance market conditions, an objective of significant importance both to the commercial space launch industry as well as the United States Government.

The discussion draft clearly demonstrates a major effort on your part to meet the potentially disabling problem of uninsurable liability risks that the U.S. commercial space launch industry faces. You are to be congratulated on a very professional effort. As you might expect, however, there are several key areas of the draft which we believe require revision. The specific changes which we suggest are interlined in the attached mark-up of the discussion draft. The basic points which these changes reflect are as follows:

1. Of critical importance to the insurance industry is the well-established policy that any Government indemnity program should not conflict with the activities of private insurers. This principle was explicitly reflected in the Price-Anderson Act of 1957 and more recently, and pointedly, in the NASA

Lillian M. Trippett, Esq.

- 2 -

December 4, 1987

Authorization Act (98-361) of 1985, 442 USC 2458b. Specifically, any Government indemnity provided should only apply to the extent that public liability claims cannot be compensated by reasonably-priced private liability insurance. It is clearly not in the public interest to put at risk taxpayer dollars to indemnify or otherwise protect the interests of United States private enterprise where such protection can be obtained on a reasonable basis from private insurance sources. This could, however, be the impact of the provisions of the Discussion Draft, which state that the licensee shall not be required to obtain liability insurance, or otherwise demonstrate financial responsibility, in an amount which exceeds \$500 million, in the case of public liability, or \$100 million, in the case of damage to Government property. These dollar figures are not necessarily the limits of the private insurance market today, nor may they be in the future, and, therefore, specific dollar limits should not be fixed or prejudged by the proposed bill.

2. Our second key concern is that the Discussion Draft does not deal with the problem, as highlighted in the recently-approved AIAA position paper, that the responsibility of the U.S. commercial space launch industry for damage to essential Government launch facilities should not exceed insurable levels. To impose such uninsurable risks on the emerging U.S. commercial space launch industry could have a major adverse impact upon its viability and success and, as you know, would place it at a significant disadvantage vis-a-vis foreign launch service providers. The attached mark-up contains a suggested add-on sentence to subparagraph (C)(2) on page 5, which would authorize the Secretary of Transportation, on behalf of the United States, to waive any claims against the licensee, etc., for damage to Government property to the extent that the aggregate of such claims exceeds the required insurance or other private financial protection.

Lillian M. Trippett, Esq.

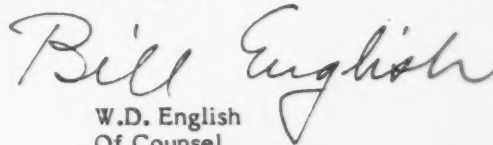
- 3 -

December 4, 1987

3. The third point deals with what may be a technical correction with respect to the scope of the governmental protection proposed with respect to public liability claims which exceed available private financial protection. The Discussion Draft states that this protection shall not be made available in the event public liability claims are based on negligence or wilfull misconduct. As the concept of public liability, with rare exceptions, is generally based upon various standards of negligence, including wilfull misconduct, this mandatory exclusion of protection in all such cases would, in effect, undercut one of the basic purposes of the proposed bill. Our suggestion is that you utilize the language from Section 2548b(b) of the NASA Authorization Act of 1985, which gave discretion to the Administrator to limit the scope of any governmental protection in the event the claims result from actual negligence or wilfull misconduct.

The above comments reflect serious concerns of Jim Barrett, particularly that provision of the discussion draft which would have the effect of congressionally mandating an artificial limit on private insurance protection. We would appreciate the opportunity of discussing these comments with you and Chairman Nelson prior to introduction of the bill.

Sincerely,



W.D. English
Of Counsel
TECHNOLOGY RISK
ADMINISTRATORS

cc:(w/attach.)
James W. Barrett
John Graykowski



Suite 6100
2000 Pennsylvania Avenue, N.W.
Washington, D.C. 20006

(202) 861-0850
Rapidfax (202) 861-0347
Telex 904 247

December 29, 1987

The Honorable Bill Nelson
Chairman, Subcommittee on Space
Science and Applications
Committee on Science, Space and
Technology
U.S. House of Representatives
2404 Rayburn House Office Building
Washington, DC 20515-0911

RECEIVED

FEB 29 1988

Gen. Sec. on Science, Space,
Technology

Dear Bill:

You and the other Sponsors of H.R. 3765 have made a very significant contribution to restoring U.S. leadership in space transportation. Your bill would provide essential protection to commercial launch service providers, as well as to the public, in the event injuries or damages resulting from a commercial launch exceed available insurance or other private financial protection. There is little doubt that, without such extraordinary protection, the viability of the U.S. commercial launch industry, particularly at this early stage in its development, will be in jeopardy. The United States cannot afford to miss the promising opportunities in commercial space.

As I know you are aware, a key first step in obtaining broad-based support for H.R. 3765 is to ensure prospective supporters that there is substantial private financial protection available through the world insurance market and, therefore, the Government's responsibility for claims would arise only in the unlikely event of a catastrophic incident where resulting injuries and damages exceed such private financial protection. INTEC, as the largest, and only dedicated, underwriter of space risks, is keenly interested in participating in the challenge of providing such private financial protection. Technology Risk Administrators (RISKTEC), a sister company of INTEC, is in the process of establishing a centrally-managed underwriting facility which would provide, on a cost-effective basis, optimum and dependable insurance protection. I feel confident that this



The Honorable Bill Nelson
December 29, 1987
Page Two

underwriting facility could provide and maintain public liability insurance capacity for launch risks significantly in excess of \$500 million. I also believe the Facility could provide substantial capacity to cover the risk assumed by the U.S. launch industry for damage to Government property. This conviction brings me to a suggestion with respect to Section 4. Insurance Requirements of Licensee of H.R. 3765.

Under this section of the bill, the Secretary of Transportation is required to determine the "maximum probable" loss that could result from a launch, and the licensee furnishing that launch is then required to demonstrate it has sufficient private financial protection, e.g., insurance, to compensate claims that could arise from the maximum probable loss. However, if the Secretary should find that the maximum probable loss would exceed \$500 million, in the case of public liability claims, the licensee is not required to obtain liability insurance, or demonstrate other private financial protection, to compensate such losses that might exceed \$500 million. This is the case even though insurance is available at reasonable cost to cover losses in excess of \$500 million. These losses - in excess of the \$500 million - would be paid by the Government, presumably at taxpayer expense.

I am very concerned that this cap on private financial protection will have negative consequences, first, with respect to additional support from those who may conclude that tax dollars should not be utilized as a substitute for reasonably available private financial protection and, secondly, with respect to the insurance market. A Congressional cap on private insurance can be viewed by underwriters as a disincentive to optimize insurance capacity in support of the U.S. commercial launch industry.

I would like to suggest an alternative to the insurance cap, one that has been adopted in several previous instances in which the Government stepped in to cover uninsurable risks associated with high-technology, national-interest activities of private industry. Specifically, any Government protection should be provided only if, and to the extent, reasonably-priced insurance capacity is unavailable. This is the approach followed by Congress in 1979 in authorizing NASA to undertake to protect users of its space vehicles. No limit of insurance was then set by Congress. NASA was directed to ascertain what capacity could



The Honorable Bill Nelson
December 29, 1987
Page Three

be made available at reasonable cost and to prescribe that amount as a condition of shuttle use. The indemnification of the user could only apply to the extent "claims are not compensated by liability insurance of the user." This followed exactly the approach established in the Price-Anderson Act of 1957.

We have provided to Lillian Trippett proposed language changes to H.R. 3765 to implement this suggestion. I would appreciate the opportunity to discuss with you further the status of the RISKTEC Underwriting Facility and the proposed modification to H.R. 3765.

Again, please accept my congratulations on a bill which is of great value in resolving a fundamental obstacle to a return to U.S. leadership in space transportation.

Very truly yours,

James W. Barrett
President

JWB/elf

cc: Sponsors, H.R. 3765
W. D. English

JAN 25 1988

Joseph M. Rosenthal
Senior Vice President, National Director
Aviation & Aerospace

**Alexander
& Alexander**

Alexander & Alexander of New York Inc.
220 East 42nd Street
New York, New York 10017
212 - 973-4200

January 12, 1988

The Honorable Bill Nelson
Chairman, Subcommittee on
Space Science and Applications
Committee on Science Space and Technology
U.S. House of Representatives
2404 Rayburn House Office Building
Washington D.C. 20515-0911

Re: HR3765
The Commercial Space Launch Act Amendments of 1987

Dear Mr. Nelson,

As one of the world's largest insurance brokers, and one of the most active in the area of commercial space insurance, we offer our support for HR3765. Based upon our reading of the Bill, we find it to include responsible solutions to the problems of all parties concerned with the creation of a truly commercial United States launch industry.

In requiring the licensee to provide insurance and/or demonstrate financial responsibility to compensate for the maximum probable loss, the bill asks them to accept responsibility for their launch vehicle while providing flexibility in how they are allowed to do so e.g. commercial insurance, self insurance or risk retention. At the same time, by allowing the Secretary to determine the maximum probable loss on an individual launch basis, you have addressed the needs of the newer "start-up" ELV operators who will constitute an important part of this industry in the future.

Based upon studies done on behalf of a client and our discussions with the U.S. Air Force, we find the "not to exceed" figures of \$500,000,000 for liability and \$100,000,000 for damage to U.S. Government property to be both reasonable and realistic. In fact, we believe that the Secretary's study of the actual exposure (on the maximum probable basis) resulting from most launches will produce a figure below the "not to exceed" figure for third party liability.

continued....

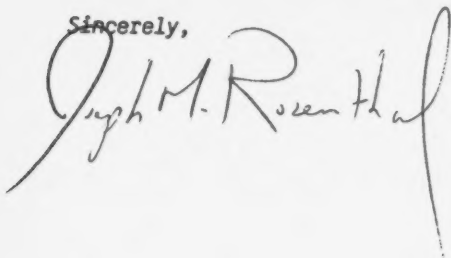
**Alexander
& Alexander**

Page -2-

Certain aspects of the bill, particularly as it addresses the need for cross waivers between the licensee and it's contractors and sub-contractors must be closely reviewed with the intent of insuring equitable treatment for all those (including the licensee) involved in a launch.

Again, we believe that HR3765 represents a significant first step in the resolution of the problems of liability and indemnification that have so seriously hindered a commercial launch industry in the United States.

Sincerely,

A handwritten signature in cursive script, appearing to read "J. M. Rosenthal". The signature is written in dark ink and is positioned below the word "Sincerely,".

JMR:fh

cc: Sponsors, H.R. 3765

**TUCSON SPACE SOCIETY**

5100 N. Moonstone Drive
Tucson, Arizona 85715
(602) 749-2247

FEB 09 1988

February 2, 1988

The Honorable Bill Nelson
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Nelson:

The members of the Tucson Space Society feel that the growth of the private space launch industry in the U.S. is vital to the economic health and national security of our country. Some of us are actively working to develop local business initiatives that will contribute to our country's development of space.

Many of us have followed the progress of space related legislation for several years, and we believe that your bill, HR 3765, is a positive contribution to the solution of some of the most pressing problems facing the developing space launch industry -- including the liability insurance issue. We have studied the first draft of your bill, and we are enclosing our comments. We hope these comments will be of help in producing the final version of the bill. We would also be happy to act as a resource for suggesting names for witnesses for future hearings on this or related bills.

Sincerely,

Mark Voelker, President

enclosure

Comments on H.R. 3765
by
Members of the Tucson Space Society

The legislation proposed by Mr. Nelson is a step in the right direction, but we feel there is room for improvement on some points. The Act is good in that it recognizes that this nation's nascent private launch industry will have great difficulty in succeeding with existing legal and insurance practices.

In general we agree with the findings in Section 1. However, we feel the bill could be strengthened by explicitly stressing that assured access to space is vital for this nation's security. Never again should the United States be in the position it has had to endure for the last two years. With the Shuttle indefinitely grounded and a fluke failure of a Titan rocket, a vital KH-11 reconnaissance satellite sat on the ground for nearly 18 months while these launch vehicle failures were investigated and hardware prepared for a second launch of a KH-11. In addition, the space science program of the U.S. has virtually ground to a halt because the space science community was forced to schedule the launch of all of its satellites and space probes on the Shuttle. Though many of these spacecraft could be launched on expendable rockets, it will be some time before enough of these vehicles are again available to support an effective space science program.

Only by having a mixed fleet of launch vehicles, some necessarily with redundant capabilities, can access to space be truly assured. The best and most cost effective way to bring such a mixed fleet of launch vehicles into existence is through private enterprise.

Section 3(b) is an improvement on the original legislation. It will ensure that the government does not unfairly compete with private launch facilities, hardware and services.

Section 4(a)(3) provides an appropriate method for recognizing that not all licensees should be required to provide liability coverage at the ceiling level, but greater guidance needs to be offered for the procedure in determining the maximum probable loss of a licensee. The Secretary should be directed to establish regulations specifying the information which will be required to be submitted and such information should include:

- 1) Vehicle size and type;
- 2) Launch site and trajectory;

and 3) Payload characteristics. These guidelines will provide recognition that the potential claims against operators of small vehicles at remote sites may be significantly less than larger vehicles operated at more convenient locations.

Requiring a determination by the Secretary within 90 days is certainly a reasonable schedule from a licensee's viewpoint, but the Secretary should also be required to notify the licensee much earlier, perhaps within 30 days if insufficient information is submitted for determining maximum probable loss in a specific case. If such additional information is required, the Secretary should reject the submission and include in the rejection an itemization of the needed information. The licensee should then resubmit the request for determination, including all required information, and a new 90 day period would begin.

Section 4(a) should also include a provision for public hearings in the review process before the ceiling is adjusted.

Sections 5, 6, 7 and 8 are satisfactory as written.

In Section 9, the goal of "developing higher performance and lower cost ... technologies" sounds good, but we feel a different emphasis is needed. Since the dawn of the Space Age, American rocket engineers both in NASA and in the major aerospace firms have followed the grail of "higher performance". While we have gained "higher performance" we have also gained a national Space Transportation System (the Shuttle) that is so complex and requires so many support personnel that, when it resumes

operations, launch costs will likely be on the order of \$7,000 per pound. Moreover, the Shuttle has proven to be terribly unreliable. This unreliability has caused numerous launch delays and ultimately was a principal cause of the tragedy which destroyed the Challenger and her crew. Our primary goal for future launch vehicle designs should be to lower the cost of taking payload into orbit. Only by drastically lowering launch costs can the industrialization of space become a viable proposition.

The achievement of this goal requires that the total system, rather than just "component technologies" as referred to in this Act, be reviewed for cost effectiveness. The Administrator should be directed to include in his program attention to total system concepts such as the big dumb booster and utilization of External Tanks. While these concepts have appeared numerous times in the past, they have not achieved any official recognition largely because they do not conform to the traditional interpretation of "higher performance."

Finally, Section 5 implicitly acknowledges President Reagan's policy of launching only Shuttle-specific commercial payloads on the Shuttle. But that policy has not been established by formal legislation. We think it would be prudent to cast the President's policy in legislation — rather than leaving it as an executive policy statement that

could be changed at the whim of some future President. This bill seems an appropriate vehicle for doing this, and we suggest that a section be added which includes language to the effect that

"A commercial payload for which a suitable commercial launch system exists shall not be launched with the Space Transportation System (the Shuttle) or with any other Government owned or operated space launch vehicle or system. This prohibition shall not apply to payloads owned or operated by commercial enterprises when such payloads are launched and operated for the purpose of developing equipment, systems, processes, designs, techniques or to gain other knowledge which is expected to lead to commercial activities in space or to commercial applications in space or on the Earth."

This would allow NASA to support research and development which will lead to more productive uses of space while formalizing assurances that anticipated markets, on which private investment decisions will be based, will not be reduced nor destroyed by arbitrary Government action resulting in launch prices which private launch companies could not hope to meet. It will also allow the Government to continue launching small satellites for non-profit organizations such, as the Amateur Radio Satellite Corporation (AMSAT), as space and weight restrictions permit.

February 10, 1988

Dear Representative:

Thank you for your leadership in cosponsoring H.R. 3765, the Commercial Space Launch Act Amendments. Legislation will greatly assist industry's ability to establish a viable and competitive U.S. commercial space transportation capability. This capability is not only critical to domestic companies which desire to compete as launch service providers, but is of vital importance to satellite manufacturers, telecommunication service providers and other commercial and scientific users which depend on reliable, cost effective and diverse launch services for their economic success. A strong domestic, commercial ELV industry will protect jobs and provide favorable trade balances for these and other related industries whose sales represent billions of dollars. Legislation is necessary to ensure that U.S. industry will never again be solely reliant on foreign entities for commercial access to space as was the case in the months following the Challenger accident.

Legislation is necessary to address several immediate needs of the emerging commercial space transportation industry. The transition from a U.S. dependence on solely government-provided launch services to a primary reliance on commercial launch services will require a commitment by our government to policies which allow private industry to quantify and minimize the risks associated with launch services.

A fundamental provision of the legislation is the shared risk approach offered to commercial launch service providers, their customers, and the public in the event that damages resulting from a commercial launch accident exceed the financial protection reasonably available from the insurance marketplace. This shared risk approach is similar to that provided by the government when NASA furnished commercial launch services. It is essential that domestic firms not be required to "bet their company" each time they participate in a launch activity. Moreover, the enactment of this will allow U.S. companies to compete with foreign launch service providers whose governments supply either similar or complete protection against such claims.

We again commend your efforts on H.R. 3765 and look forward to working with you in establishing a shared risk approach that is so essential to the commercial ELV industry's survival. This will ensure that the United States will remain competitive with the heavily subsidized efforts of our foreign competitors and will be a major step in restoring U.S. preeminence in commercial space activities.

Sincerely,

Alexander & Alexander, Inc.
Contel ASC
Ford Aerospace Corporation
GE Communications & Services
General Dynamics Inc.
GTE Spacenet Corporation
Hughes Aircraft Company
International Technology
Underwriters

LTV Missiles & Electronics Group
Marsh and McLennan, Inc.
Martin Marietta Corporation
McDonnell Douglas Astronautics
Company
National Association of Insurance
Brokers
Satellite Broadcasting and
Communications Association of
America

125 Broad Street
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Telex No. 6720134 JANHNY UW

**JOHNSON
& HIGGINS** Established 1845

February 12, 1988

The Honorable Bill Nelson
Chairman, Subcommittee on Space
Science and Applications
Committee on Science, Space and Technology
U.S. House of Representatives
2404 Rayburn House Office Building
Washington, D.C. 20515-0911

Dear Mr. Nelson:

We are writing this letter in support of Bill H.R. 3765 pertaining to U.S. Commercial Access to Space. Johnson & Higgins is the world's largest privately held insurance broker and we have a specialty Space Systems Group which is involved with satellite owners, launch service providers and other space users. It is important that our clients have an environment which is conducive to space activities and enables them to effectively compete with foreign launch systems.

In reviewing insurance section 4, Insurance Requirements of Licensee, a major concern that we have is the relationship between the "maximum probable loss" as stated in section 16 (a) (1) A (page 3, line 17) and the amount of insurance which a licensee is required to purchase under the Act. We believe wording should be incorporated which states that the licensee be required to purchase insurance (demonstrate financial responsibility) equal to the lesser of either the "maximum probable loss" or the amount of insurance available in the marketplace subject to the limitations stated in section 16 (a) (1) A and 16 (a) (1) B. This will ensure that at all times the licensee will be required to purchase insurance (demonstrate financial responsibility) which is consistent with the ever changing insurance market conditions.

Section 16 (a) (1) (B) should be amended to require the U.S. Government to enter into reciprocal waivers of claims for damage to government property in excess of insurance purchased.

/.....

Johnson & Higgins

/.....

February 12, 1988

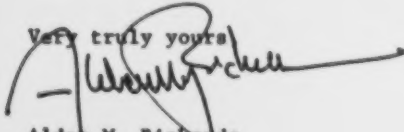
Page Two

The Honorable Bill Nelson

The most important aspect of the proposed Bill is the agreement of the U.S. Government to pay for successful claims in excess of insurance obtained. We believe this is needed to protect the financial integrity of launch service providers and their customers, contractors and subcontractors. The other very important features are the liability limitations of \$500,000,000 for third party liability and \$100,000,000 for damage to government property. Our industry will respond more positively to a set dollar requirement than to the "maximum amount of insurance available at a reasonable cost" as stated in the model ELV agreement. If these limitations are in place, launch service providers will be able to procure insurance in a competitive market place. If the launch service providers must purchase the "maximum amount of insurance available at a reasonable cost", the usual competitive market forces will be eliminated due to the great amount of capacity which will have to be obtained by the launch service providers. Rather than having alternative sources of capacity, the launch service providers will most likely rely on a sole source or at best severely limited sources of capacity. This usually results in more restrictive insurance coverage at greater cost.

We wish you success and stand ready to assist in any way we can.

Very truly yours,



Alden M. Richards
Vice President
Space Systems Group

AMR:phs

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY

570 LEXINGTON AVENUE

NEW YORK, NEW YORK 10022-6853

FRANCIS J. DeROSA
STAFF VICE PRESIDENT
AND GROUP COUNSEL

March 23, 1988

Hon. Bill Nelson
Chairman, Subcommittee on
Space Science and Applications
Committee on Science and Technology
2321 Rayburn House Office Building
Washington, D.C. 20515-6308

Dear Chairman Nelson:

GE Communications and Services ("GEC&S") hereby submits its comments for the record of the Subcommittee's recent consideration of H. R. 3765, the "Commercial Space Launch Amendments of 1987."

Overview

One of the components of GEC&S is GE American Communications ("GE Americom"), a domestic communications satellite company. GE Americom has been a pioneer in the communications satellite field, and currently manages seven in-orbit satellites. All of these satellites were launched by NASA, and GE Americom had, prior to the Challenger accident, reservations to launch two additional satellites.

GE Americom is now in the process of constructing several satellites -- including the two that were on the NASA manifest. As a result of the President's decision that NASA would henceforth be restricted to launching only government and scientific payloads, GE Americom has been actively negotiating with a number of private firms for launch arrangements via expendable launch vehicles ("ELVs").

In these negotiations, we have been advised by some ELV companies that their costs of the launch would include an element reflecting the expense of casualty and liability insurance. Other firms have told us that the cost that we would pay for launch services would include a certain amount the company would set aside for

Hon. Bill Nelson
Page Two
March 23, 1988

self-insurance. These charges would be in addition to the cost that GE Americom would spend in acquiring casualty and liability insurance of our own to protect ourselves against possible liability risks incurred by the satellite itself.

This is unlike the former arrangements under NASA, in which the government would take care of possible liability for third-party injuries and damages it caused in a launch failure, while a satellite operator would take out insurance only to cover its own risks. This is one reason we favor the continued presence of NASA in the business of launching domestic communications satellites, but we are not here to take issue with the President's decision.

While the costs of launching any payload on an ELV would normally include an element for insurance, the situation is further complicated by the fact that the ELV operators with which we have been negotiating have not been able to determine the actual cost of acquiring this insurance. This not only complicates our selection decision but also makes it difficult to ascertain the exact costs of placing a satellite in orbit.

For these reasons, GE Americom welcomes any effort to fix and possibly relieve the insurance burden on ELV operators. We believe that H. R. 3765 goes a long way in satisfying both objectives. By knowing in advance the extent of their liability, ELV operators would be in a better position to give firm quotes to satellite companies. In addition, by fixing liability at reasonable amounts, H. R. 3765 assures that ELV operators will not include in their costs potentially unlimited amounts for insurance.

We endorse the equitable cost-sharing structure of the bill. This recognizes the vital stake the United States has in retaining its leadership in space.

Another important aspect of the bill that we support is the way it defines the incremental costs for which ELV operators using government ranges must pay, since these are also directly related in the charges by ELV operators to satellite companies.

Hon. Bill Nelson
Page Three
March 23, 1988

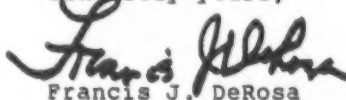
Minor Clarifications Are Required

Beyond this, we believe that H. R. 3765 could be improved by removing some ambiguities. While GEC&S is a member of an industry coalition and expects to suggest several other amendments, I would like to stress here the need, which the coalition supports, for satellites to be covered by the special insurance made possible by the bill.

We understand that the insurance available to the ELV operator under H. R. 3765 is to cover not only the risks it incurs but also the separate risks incurred by a satellite company that uses its services. But, in those instances where an ELV operator chooses to self-insure, it should be made clear that this self-insurance, together with the assumption by the government of the assumption of risks in excess of the statutory limits, applies also to satellite companies. Otherwise, as a matter of corporate prudence, satellite companies would be required to acquire additional insurance for their risks, which insurance would not be subject to the liability limitations that it would if acquired by an ELV operator. This is one oversight that should be cured.

We will be providing details to your staff, with whom we will work to ensure the enactment of this bill.

Sincerely yours,


Francis J. DeRosa

cc: All Committee Members

0821c



INTERNATIONAL TELECOMMUNICATIONS SATELLITE ORGANIZATION
 ORGANISATION INTERNATIONALE DE TELECOMMUNICATIONS PAR SATELLITES
 ORGANIZACION INTERNACIONAL DE TELECOMUNICACIONES POR SATELITE

28 March 1988

The Honorable Bill Nelson
 Chairman
 Subcommittee on Space Science
 and Applications
 Committee on Science, Space
 and Technology
 Suite 2321 Rayburn House Office Building
 Washington, D.C. 20515

Dear Chairman Nelson:

Thank you for your invitation to comment on the Commercial Space Launch Act Amendments of 1987, H.R. 3765. We hope that the following comments will be useful as your Subcommittee prepares to mark up the proposed legislation.

Since its creation more than 20 years ago, INTELSAT has been a principal user of launch vehicle services for the launching of commercial telecommunication satellites, and of American launch vehicles in particular. INTELSAT has launched 40 telecommunications satellites, all but three of which have been on U.S. launch vehicles. The INTELSAT Board of Governors has established a policy of diversity of launch vehicle suppliers, and this is only possible if there is true competitiveness among launch vehicle programs. Accordingly, INTELSAT has an abiding interest in the state of the U.S. commercial launch vehicle industry and believes that if that industry can provide reliable and economical launch services, it will be of benefit to the organization and to the more than 170 countries which the organization serves.

We regard H.R. 3765 as reaffirming, at an important time, the support of the U.S. government for a viable commercial launch industry, while fostering the growth of that industry by providing financial incentives which would make the use of U.S. launch vehicles more attractive to users.

While the bill covers a number of very important areas, its greatest significance seems to lie in the areas which reduce

- 2 -

risk to customers, such as Sections 4 and 5. It is exposure to the enormous risks posed by space activity, however remote the risks may be, which may be an unreasonable constraint upon developing telecommunications and other peaceful uses of space. Launch suppliers in other parts of the world are sensitive to these risks and have taken steps to limit the exposure of users while at the same time requiring them to obtain some minimal protection through commercial insurance.

A similar approach by the United States would certainly be welcomed by INTELSAT as a major launch customer and would, we believe, enhance the competitive position of the United States industry. Section 4 of the bill is therefore a step in the right direction. As an index of comparability of what ought to be the appropriate insurance limits, it is useful to note that Arianespace, for example, is indemnified by the French Government above a limit of approximately \$70 million. Further, in establishing the maximum amount of insurance to be required, it is important that recognition be given to the ability of the insurance market to satisfy the insurance requirements under the legislation. In this vein, in setting the limits on the insurance that licensees would be required to carry, the Secretary of Transportation should take into consideration the amount of insurance available at a reasonable premium in the world market.

In general, Section 5 of the bill, with its special incentives for certain satellites that were to be launched on the Space Shuttle, is also attractive. Certainly INTELSAT is in this category--we have signed with Martin Marietta for use of the Titan III rocket--and would benefit from the provisions in this section.

We also find attractive the requirements in Section 6 that steps must be taken by appropriate U.S. government officials to ensure that commercial launches are not unreasonably preempted by the action of U.S. agencies. As we noted in our October 1987 letter to you, it is essential to any user agreement with commercial launch companies that access to launch facilities be predictable. The provisions in this section would, in our view, provide users with such assurances. We would suggest, in this regard, that paragraph B of Section 6 make liquidated damages payable for any preemption.

Although we have no particular problem with Section 8 of the bill and, indeed, would support a commercial launch services industry that is both "reasonable and fair," we do believe that this section would benefit from some clarification as to its intent. It would be our expectation that any guidelines designed for the conduct of international launch vehicle competition would seek to promote lower prices and the highest possible reliability and predictability. With this in mind, it would be useful for the bill to make clear that such is the intention of Section 8; that in no case would the

- 3 -

objective of such international dialogues be the establishment of industry-wide increases in price, user risk or liability.

In summary, we believe that a healthy U.S. commercial launch service industry is important not only for the United States, INTELSAT's largest single member, but also for all the members and users of the INTELSAT system. Diversity of choice in the launch business should lead to greater assurance that users will have access to launch vehicles that are reasonably priced and flexibility in determining their launch schedules. In our view, H.R. 3765 presents a thoughtful approach to encouraging the development and maintenance of such a commercial launch industry in the United States.

Sincerely,



John D. Hampton
Acting Director General

15200 Omega Drive
Rockville, MD 20850-3240
301 590 7101

George P. Roberts
President

CONTEL ASC

March 29, 1988

Honorable Bill Nelson, Chairman
Subcommittee on Space Science and Applications
Committee on Science, Space and Technology
2321 Rayburn House Office Building
U.S. House of Representatives
Washington, D.C. 20515

Dear Mr. Chairman:

I am writing to avail myself of the opportunity you have provided to make further comments on H.R. 3765, the Commercial Space Launch Act Amendments.

As you know from my previous testimony, Contel ASC recognizes that legislative action is necessary to ensure the viability of a competitive, domestic, private sector-ELV program. We believe that H.R. 3765 will contribute significantly to the achievement of that goal. In addition, we believe that Section 5 of the bill, which provides certain satellite owners with incentives to utilize U.S. launch providers, is an appropriate recognition of the particularly adverse consequences for these companies of the decision by our government to terminate its role in the launch of commercial satellites.

One of these incentives, included in Section 5 (c) of the bill, requires the United States to waive payment for the provision of launch property and launch services when an eligible satellite is launched. We believe that the intent of this provision is that the benefits of the reduced costs associated with the waiver of fees are to be passed through, by the launch provider, to the satellite owner. To avoid any misunderstanding on this point, however, we believe that it would be useful to have report language clarifying that the intended beneficiary of this provision is the satellite owner. We would suggest the following:

Section 5 of the bill provides certain incentives to encourage owners of eligible satellites to use domestic launch providers. While these incentives may produce an

Honorable Bill Nelson
March 29, 1988
Page Two

incidental benefit for the launch providers, the Committee intends that the primary beneficiaries are to be the owners of eligible satellites. Where, as in Section 5 (c), the incentives result in a cost savings for the launch providers, the Committee expects that the full value of these savings will be reflected in the launch price charged by the launch providers to the owners of eligible satellites.

Thank you for your continued consideration of the views of Contel ASC on H.R. 3765.

Sincerely,


George P. Roberts



THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

April 4, 1988

The Honorable Jim Wright
Speaker of the House of Representatives
Washington, D.C. 20515

APR 15 1988

Dear Mr. Speaker:

The Department of Transportation is submitting for your consideration and appropriate reference a bill

To authorize appropriations for the fiscal years 1989 and 1990 for the Office of Commercial Space Transportation of the Department of Transportation, and for other purposes.

Since Congress enacted the Commercial Space Launch Act in 1984, the Department's Commercial Space Transportation Office has put in place the necessary licensing mechanisms to facilitate the launch of commercial payloads by private industry. In 1987, the first DOT launch license was issued to Conatec for a launch from White Sands Missile Range. We are currently processing an application by McDonnell Douglas to launch a foreign communications satellite. The Science, Space, and Technology Committee in the House, and the Commerce, Science, and Transportation Committee in the Senate, were instrumental in authorizing adequate levels of appropriations for these activities.

The Department seeks an authorization of \$3,827,000 for continuation of all current activities and expansion of licensing activities in Fiscal Year 1989. We anticipate as many as 10 new license applications for a variety of missions and would process a significant number of them in FY 1989. Our primary licensing objective is, of course, to assure that these activities are conducted in a manner that does not jeopardize public health and safety, the safety of property, or the national security and foreign policy interests of the United States.

The OCST Office was actively involved in the process leading to the President's recently announced decision to place increased reliance on private space launch services to meet this nation's launch needs. The new policy represents a coherent, comprehensive statement of the importance of a vigorous private launch industry in meeting national objectives in space. Our requested authorization for FY 1989 will permit the continuation and expansion of these efforts, which remain critical to the growth of this important industry.

- 2 -

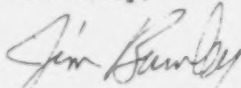
Central to encouragement of this industry is resolving the liability issues for which the Department has responsibility under sections 15(c) and 16 of the Commercial Space Launch Act. A major portion of our FY 1988 and 1989 funding is committed to the necessary hazard analysis and risk assessment work that relates directly to the Department's responsibilities in this area.

The President's recent policy initiative also entails legislative action to address the issue of potentially unlimited liability for third-party damages. The Administration seeks resolution of this problem in a manner consistent with its efforts to reform the tort litigation system generally. To this end, therefore, we propose enactment of the provision appearing as section 2 of the enclosed bill, to accomplish this objective.

The Department appreciates this opportunity to advocate a course of action that will advance the prospects of a private commercial space launch industry in the United States capable of competing successfully with that of other nations.

The Office of Management and Budget advises that the enactment of this proposal would be in accord with the program of the President.

Sincerely,



Jim Burnley

Enclosure

A BILL

To authorize appropriations for the fiscal years 1989 and 1990 for the Office of Commercial Space Transportation of the Department of Transportation, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That Section 24 of the Commercial Space Launch Act (Public Law 98-575) (49 U.S.C. 2623) is amended to read as follows:

"SEC. 24. There are authorized to be appropriated for the purpose of carrying out this Act \$3,827,000 for fiscal year 1989 and such sums as are necessary for fiscal year 1990. Sums appropriated for research and development shall remain available until expended."

Sec. 2. Section 16 of the Commercial Space Launch Act (49 U.S.C. App. 2615) is amended to read as follows:

"Sec. 16. (a) Each license issued or transferred under this Act shall require the licensee to obtain liability insurance, or demonstrate financial responsibility, at least in such amounts as are considered by the Secretary to be necessary --

"(1) to satisfy potential claims for personal injury, death, or loss of or damage to property resulting from activities carried out under the license; and

- 2 -

"(2) consistent with the international obligations of the United States.

"The Secretary shall prescribe such amounts after consultation with the Attorney General and other appropriate agencies.

"(b) -- Non-economic damages may not be awarded in excess of \$200,000 in any action against a covered party by any person for personal injury or death attributable to the launch of a launch vehicle, the operation of a launch site, or the provision of launch services. As used this section --

"(1) 'action' means any action or claim filed in Federal or State court (including multiple actions or claims) seeking damages from a covered party for personal injury or death, and includes all plaintiffs and all defendants in such actions, which arise out of or were caused by the same personal injury or death.

"(2) 'covered party' means the United States, employees, contractors, and subcontractors of the United States, persons licensed under this Act, contractors, subcontractors or customers of such licensees, and contractors or subcontractors of such customers.

"(3) 'non-economic damages' means all damages other than damages for economic loss, and includes punitive or exemplary damages.

"(4) 'economic loss' means past or future (A) expenses of health or other care, (B) expenses of rehabilitation, (C) loss of earnings, (D) loss of homemaker services, (E) burial expenses, (F) losses relating to property damage, and (G) any commercial loss, including lost profits or revenues."

Section-by-Section Analysis

Section 1 of the bill would authorize appropriations for fiscal years 1989 and 1990 for the Department of Transportation's Office of Commercial Space Transportation programs. A total of \$3,827,000 would be authorized for the activities of this Office in fiscal year 1989 and such sums as may be necessary for that purpose would be authorized for fiscal year 1990. Appropriations made for research and development would be available until expended, because these activities typically involve a series of contracts where one cannot begin until an earlier one is completed.

The Commercial Space Launch Act of 1984 designates the Department of Transportation as the federal agency responsible for overseeing and coordinating the conduct of commercial launch operations from national and non-government launch facilities. This mandate includes responsibility for issuing and transferring licenses authorizing all commercial launch activities and ensuring that those activities are conducted in a manner that does not jeopardize public health and safety, the safety of property, or the national security interests and foreign policy interests of the United States. The Office of Commercial Space Transportation (OCST) plans and conducts research, development, and program management activities in support of the Secretary's responsibilities under the Act. The proposed FY89 activities of OCST involve six principal areas: safety planning and development; licensing procedures, operations and enforcement; space hazards analysis and management; industry analysis and planning; and public awareness and support. Some of the activities are new programs, while others are continuations and extensions of activities initiated in 1985 and 1988. The object of these activities is to develop regulations, standards, and policies that will guide all facets of the commercial launch industry and its support industries.

Section 2 of the bill would amplify the current, very general direction to the Department to establish, in consultation with the Attorney General and other appropriate parties, appropriate liability insurance requirements for launch licensees. Pursuant to the President's recently established policy initiative on behalf of commercial space transportation, section 16 of the Act would be modified to establish a basic insurance principle beneficial to the industry. Section 16 as amended is consistent with the Administration's policy regarding tort liability reform. Non-economic damages is capped at \$200,000, while recovery for economic damages remains limited only to the monetary costs which are sustained by the injured party. Accordingly, these provisions adequately and responsibly address the liability problems facing the commercial space launch industry.

April 4, 1988

Honorable Bill Nelson, Chairman
 Subcommittee on Space Science and Applications
 Committee on Science, Space, and Technology
 Rayburn House Office Building
 Washington, D.C. 20515

Dear Mr. Chairman:

As you requested, it is with great pleasure that we enclose our comments on H.R. 3765, together with justifications for our proposed changes. As you know, the twenty companies signing this letter are strong supporters of this bill. We submit these joint comments for your use, and the use of the other members of your Subcommittee, in the belief that they clarify and strengthen the risk sharing principles that the bill embodies. They have been discussed extensively and, in certain instances, represent an accommodation between competing private sector interests. Three exceptions are set forth in Attachment A.

We look forward to working with you to ensure the passage of this important legislation.

Sincerely,

Alexander & Alexander, Inc.
 American Rocket Company
 Astrotech Space Operations, Inc.
 AT&T
 COMBAT
 Contel ABC
 Corroon & Black Inspace
 Ford Aerospace & Communications
 Corporation
 General Dynamics Corporation
 General Electric Communications &
 Services
 GTE Spacenet Corporation

Hughes Aircraft Company
 International Technology
 Undervriters
 Johnson & Higgins
 LTV Missiles & Electronics Group
 Martin Marietta Corporation
 McDonnell Douglas Astronautics
 Company
 National Association of Insurance
 Brokers
 Space Services, Inc.
 Satellite Broadcasting and Communi-
 cations Association of America

ATTACHMENT A

Contel ABC supports the comments attached hereto, except for the proposed change on page 7, line 20.

International Technology Underwriters supports the comments attached hereto, except that it proposes the following amendments to Section 4:

Amendment 1:

Page 4, line 4, strike "\$500,000,000." and substitute following: "the maximum amount of insurance available to cover such loss or damages at reasonable cost and on reasonable terms from private insurance sources."

Amendment 2:

Page 4, line 20, strike "\$100,000,000." and substitute following: "the maximum amount of insurance available to cover such loss or damages at reasonable cost and on reasonable terms from private insurance sources."

Justification:

INTEC believes that government insurance protection should be provided to private industry only to the extent reasonably-priced insurance capacity is not available to cover the maximum probable loss.

General Dynamics Corporation and Martin Marietta Corporation support the comments attached hereto, except that they would delete Section 8(b), page 10, lines 7 through 12, for the reasons stated in their February, 1988, testimony before the Subcommittee.

March 31, 1988

JUSTIFICATIONS FOR PROPOSED AMENDMENTS
TO H.R. 3765

SECTION 1

Amendment 1

Insert "commercial" before "space launch industry" on page 1, line 7, and page 2, lines 3 and 5.

Justification

Emphasizes that bill's purpose is to facilitate commercial access to space.

Amendment 2

Insert new subparagraph (4) as follows:

"(4) potential third party injury and damage to property resulting from spacecraft launching activities could exceed the amount of insurance available at a reasonable cost;"

and renumber subparagraphs (4) and (5) as (5) and (6) respectively.

Justification

Strengthens the bill by specifically recognizing that the insurance capacity available at a reasonable cost could be inadequate to cover the full extent of potential losses from spacecraft launching activities.

SECTION 3

Amendment 1

Amend subparagraph (b) as follows:

"In taking such actions, the Secretary shall take into account the commercial availability on reasonable terms and conditions of substantially equivalent launch property or services from a domestic source."

Justification:

Subparagraph (b) directs the Secretary of Transportation not to facilitate or encourage commercial use of Government launch property or services if "substantially equivalent launch property or services are otherwise commercially available from a domestic source on reasonable terms and conditions." This subparagraph is designed to assist private U.S. companies providing launch property and services.

-2-

As written, however, this subparagraph could have a destabilizing effect on the ELV companies' use of Government services and facilities. It could result in them having to prove to the U.S. Air Force and NASA, possibly prior to each launch, that "substantially equivalent facilities" are not available "on reasonable terms and conditions". This could further complicate the already complex and difficult manifesting process for the ELV companies.

As amended, Subparagraph (b) provides a reasonable accommodation between these competing private sector interests.

SECTION 4

Amendment 1

Amend from "in" on page 3, line 21, to "license." on page 4, line 1, as follows:

"in an amount sufficient to compensate the maximum probable loss from claims by a third party for death, bodily injury, or loss of or damage to property resulting from activities carried out under the license."

and insert a new Section 2 in H.R. 3765 that amends Section 4 of the Commercial Space Launch Act of 1984 by adding a new definition as follows:

"(12) 'third party' means any person or entity other than the United States or its agencies, the licensee or its contractors, subcontractors or customers, or the contractors or subcontractors of such customers, involved in launch services."

and renumber all the subsequent sections of H.R. 3765.

Justification:

This subparagraph is designed to govern third party claims. The United States and its agencies are not third parties. Their claims are governed by Subparagraphs (B), (C) and (D) of this paragraph, as amended herein. They are thus expressly excluded from this subparagraph under the proposed definition of "third party". A corresponding amendment is proposed to Paragraph (b)(1) of Section 4.

Claims against the United States brought by foreign persons or entities under the Outer Space Treaty would constitute third party claims and would be covered by the insurance or demonstration of financial responsibility required by this subparagraph.

The words "against any party" are deleted on the grounds that they add nothing to this subparagraph. A corresponding amendment is proposed in Subparagraph (B).

-3-

Amendment 2

Insert after "exceeds" on page 4, line 4, the word "either", and after "\$500,000,000" the following:

"or the maximum liability insurance available on the world market at a reasonable cost, whichever is less."

Justification:

Liability insurance capacity could be less than the amount of insurance required to be carried under this subparagraph. This amendment provides that, in this case, the licensee need obtain only the maximum insurance available on the world market at a reasonable cost. This is similar to the practice followed by NASA when it launched commercial payloads.

Amendment 3

Insert after "exceeds" on page 4, line 15, the word "either" and after "\$100,000,000" the following:

"or the maximum insurance available on the world market at a reasonable cost, whichever is less."

Justification:

This amendment is similar to Amendment 2 above.

Amendment 4

Amend from (C), page 4, line 16, through "license." on page 5, line 2, as follows:

"Each license issued or transferred under this Act shall require the licensee to enter into reciprocal waivers of claims with its contractors, subcontractors and customers, and the contractors and subcontractors of such customers, involved in launch services, under which each party agrees to be responsible for any damage it sustains or for any injury to its own employees resulting from activities carried out under the license."

Justification:

This subparagraph, as amended, requires reciprocal waivers among all parties to the launch other than the United States, and requires each such party to be responsible for any damage it sustains or for any injury to its own employees resulting from activities carried out under the license. The language used conforms to the NASA precedent. The subparagraph, as amended, eliminates any optional insurance requirement as unnecessary.

Amendment 5

Delete Subparagraph (D) in its entirety and insert the following:

"(D) The Secretary, on behalf of the United States, its agencies, personnel, contractors and subcontractors, shall enter into reciprocal waivers of claims with the licensee, its contractors, subcontractors and customers, and the contractors and subcontractors of such customers, involved in launch services, under which each party agrees to be responsible for any damage it sustains or for any injury to its own employees resulting from activities carried out under the license, provided, however, that any such waiver shall cover only those portions of such claims that exceed the amounts specified in subparagraphs (A) and (B) of paragraph (1), unless any such claim involves the wilful misconduct or reckless disregard of the United States, in which case the United States shall waive its right to recover any damages under subparagraph (B) of paragraph (1)."

Justification:

The amendments to this subparagraph require the United States, its agencies, personnel, contractors and subcontractors, to enter into reciprocal waivers with all the other parties to the launch with respect to any damage they sustain or for any injury to their own employees resulting from activities carried out under the license. However, any such waiver shall apply only to those portions of such claims that exceed the insurance amounts specified in subparagraphs (A) and (B) of paragraph (1). In the event that any such claim results from the wilful misconduct or reckless disregard of the United States, the United States shall waive its right to recover against the insurance provided under subparagraph (B) of paragraph (1). This subsection, as amended, conforms with the President's Space Policy Initiative with respect to damage to U.S. Government property.

Amendment 6

Insert after "obtained," on page 5, line 8, the following:

" or demonstration of financial responsibility made"

and after "States" on page 5, line 10, the following:

", its agencies, personnel, contractors and subcontractors,"

and after "parties," on page 5, line 13, the following:

"or beneficiaries, as the case may be,"

-5-

Justification:

These amendments make it clear that a licensee that elects to demonstrate its financial responsibility under Section 4 must explicitly include in any such demonstration a non-waivable undertaking to cover the risks of the parties set forth in the subparagraph to the extent of their potential liabilities.

The inclusion of the agencies, personnel, contractors and subcontractors of the United States is a conforming amendment.

Amendment 7

Delete after "shall," on page 5, line 21, the words "once every" and insert in lieu thereof "within", and insert after "1987" on page 5, line 23, the following:

"and once every year thereafter,"

Justification:

These amendments require the Secretary to review the amounts specified in the last sentence of subparagraphs (A) and (B) of paragraph (1) within 3 years after the date of the enactment of these amendments and once every year thereafter, rather than once every three years. This will enable the Secretary to reflect more accurately changes in liability expectations.

Amendment 8

Delete after (b)(1) on page 6, line 4, through "services," on page 6, line 15, and insert the following:

"The Secretary shall provide for the payment of successful claims (including reasonable expenses of litigation or settlement) by a third party against the licensee or any contractor, subcontractor or customer of the licensee or any contractor or subcontractor of such customer resulting from activities carried out pursuant to a license issued or transferred under this Act . . ."

Justification:

These amendments are conforming amendments only. See Amendments 1 and 2 above.

Amendment 9

Insert after "reasonable" on page 7, line 7, the following:

", provided, however, that the amount of any claim determined by the final judgment of a court of competent jurisdiction shall be deemed by the Secretary to be just and reasonable."

Justification:

This amendment limits the Secretary's discretion to withhold payments under paragraph (1) in cases in which a final judgment of a court of competent jurisdiction has been entered.

Amendment 10

Delete after (4) on page 7, line 8, through "Code." and insert the following:

"Claims under paragraph (1)(A) shall be deemed to be claims against the United States, and the Secretary shall pay such claims under section 1304 of title 31, United States Code."

Justification:

This amendment makes it clear that claims under the Act will be payable under section 1304 of title 31, United States Code.

Amendment 11

Delete after "personnel." on page 7, line 18, through "agents.", page 7, line 21, and insert the following:

"The Secretary may not under this subsection relieve the United States of liability for damage or injury resulting from the reckless disregard or wilful misconduct of the United States or its agents."

Justification:

These amendments merely conform this subsection to subsection (1)(D). See Amendment 5 above.

SECTION 5

Amendment 1

Delete (b) on page 8, line 21, through "1986." on page 9, line 6, and renumber subsections (c) and (d) as (b) and (c) respectively.

Justification:

This amendment eliminates a proposed requirement for the Secretary of Transportation to take steps to ensure priority launch status for "eligible satellites", wherever practicable. This subsection cannot provide the "eligible satellite" owner with any launch priority status unless it were to interfere with launch contracts previously entered into by the launch providers. Any such interference would require launch providers to abrogate contracts with other customers. It would be perceived by these customers as a form of launch preemption, hampering the marketing of launch services by U.S. launch companies in competition with foreign launch providers. It should therefore be deleted.

SECTION 6

Amendment 1

Delete "unreasonably" on page 10, line 4, and insert after "need." on page 10, line 6, the following:

"Any determination of imperative national need shall be made by the Secretary of the Air Force or the Administrator of the National Aeronautics and Space Administration and shall not be delegated."

Justification:

Under the Launch Facilities Agreements with the U.S. Air Force, the Cape Canaveral Center Commander can preempt a commercial launch for any U.S. Government mission. The amendment makes it clear that any such determination must be made at a policy level within the U.S. Air Force and, in the case of Cape Kennedy launches, within the NASA that is senior enough to balance any competing requirements of the U.S. Government and the commercial launch industry.

Amendment 2

Insert after (A). on page 10, line 12, the following:

"Such liquidated damages shall be paid to the licensee and/or the customer of the licensee as these parties may agree."

Justification:

This amendment merely specifies to whom any liquidated damages under this subsection shall be payable, and allows these parties to allocate any such award between themselves as they may agree.

SECTION 9

Amendment 1

Insert after "shall" on page 11, line 15, the following:

", in consultation with representatives of the space launch and satellite industry,"

Justification:

This amendment merely provides for industry participation in NASA's design of the research program on launch systems component technologies.

100TH CONGRESS
1ST SESSION

H. R. 3765

To facilitate commercial access to space, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

DECEMBER 15, 1987

Mr. NELSON of Florida (for himself, Mr. ROE, Mr. LUJAN, Mr. WALKER, Mr. BROWN of California, Mr. LEWIS of Florida, Mr. VOLKMER, Mr. PACKARD, Mr. HALL of Texas, Mr. HENRY, Mr. MCCURDY, Mr. SLAUGHTER of Virginia, Mr. MINETA, Mrs. MORELLA, Mr. MACKAY, Mr. TORRICELLI, Mr. CHAPMAN, Mr. NOWAK, Mr. PERKINS, Mr. NAGLE, Mr. SKAGGS, and Mr. LAGOMARSINO) introduced the following bill; which was referred to the Committee on Science, Space, and Technology

A BILL

To facilitate commercial access to space, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 SECTION 1. SHORT TITLE; FINDINGS.

4 (a) This Act may be cited as the "Commercial Space"
5 Launch Act Amendments of 1987".

6 (b) The Congress finds that—

7 (1) a United States ^{/commercial} space launch industry is an es-
8 sential component of national efforts to assure access
9 to space for Government and commercial users;

- 2 ...-tiate, and promote the use of the United States
 3 ~~commercial~~ /space launch industry in order to continue United
 4 States aerospace preeminence;
 5 (3) the United States ~~space launch~~ /commercial industry must
 6 be competitive in the international marketplace;

(4) Potential third-party injury and damage to property resulting from spacecraft launching activities could exceed the amount of insurance available at a reasonable cost;

- 7 (5) ~~(4)~~ Federal Government policies should recognize
 8 the responsibility of the United States under interna-
 9 tional treaty for activities conducted by United States
 10 citizens in space; and
 11 (6) ~~(5)~~ the United States must maintain a competitive
 12 edge in international commercial space transportation
 13 by ensuring continued research in launch vehicle com-
 14 ponent technology and development.

Section 2. Definitions. Section 4 of the Commercial Space Act (49 U.S.C. App. 2603) is amended by adding the following new definition:

"(12) 'Third party' means any person or entity other than the United States or its agencies, the licensee or its contractors, subcontractors, or customers, or the contractors or subcontractors of such customers, involved in launch services."

15 SEC. ³ ~~RESPONSIBILITIES UNDER COMMERCIAL SPACE~~
 16 ~~LAUNCH ACT.~~

17 Section 5(a)(1) of the Commercial Space Launch Act
 18 (49 U.S.C. App. 2604(a)(1)) is amended to read as follows:

19 "(1) encourage and facilitate commercial space
 20 launches by the private sector, consistent with the
 21 space policies of the United States as established in
 22 public law; and".

23 SEC. ⁴ ~~DEFINITION OF DIRECT COSTS.~~

24 (a) Section 15(b)(1) of the Commercial Space Launch
 25 Act (49 U.S.C. App. 2614(b)) is amended by inserting at the

1 end the following: "For purposes of this paragraph, the term
2 'direct costs' means the costs incurred by the United States
3 as a result of an acquisition of launch property or launch
4 services which exceed the costs that would have been in-
5 curred if such acquisition had not occurred."

6 (b) Section 15(a) of the Commercial Space Launch Act
7 (49 U.S.C. App. 2614(a)) is amended by adding at the end
8 the following new sentence: "~~The Secretary shall not take~~
9 ~~such actions if substantially equivalent launch property or~~
10 ~~services are otherwise commercially available from a domes-~~
11 ~~tic source on reasonable terms and conditions.~~"

"In taking such actions, the Secretary shall take into account
the commercial availability on reasonable terms and conditions
of substantially equivalent launch property or services from a
domestic source."

12 SEC. 1. INSURANCE REQUIREMENTS OF LICENSEE.

13 (a) Section 16 of the Commercial Space Launch Act (49
14 U.S.C. App. 2615) is amended by striking "Sec. 16." and all
15 that follows through "other appropriate agencies." and in-
16 serting in lieu thereof the following:

17 "Sec. 16. (a)(1)(A) Each license issued or transferred
18 under this Act shall require the licensee—

19 "(i) to obtain liability insurance; or

20 "(ii) to demonstrate financial responsibility

21 in an amount sufficient to compensate the maximum probable

22 loss from claims ^{third party} ~~against any party by a person or entity,~~

23 ~~other than the licensee or a contractor, subcontractor, or con-~~

24 ~~somer of the licensee involved in providing the launch serv-~~

25 ~~ices,~~ for death, bodily injury, or loss of or damage to
property

- 1 resulting from activities carried out under the license. In no
 2 event shall a licensee be required to obtain liability insurance
 3 or demonstrate financial responsibility under this subpara-
 4 graph in an amount which exceeds ^{either} \$500,000,000 or the
 maximum liability insurance ^{/available} on the world
 market at a reasonable cost, whichever is
 less.
- 5 k. (B) Each license issued or transferred under this Act
 6 shall require the licensee—
 7 (i) to obtain insurance; or
 8 (ii) to demonstrate financial responsibility
 9 in an amount sufficient to compensate the maximum probable
 10 loss from claims against any party by the United States for
 11 loss of or damage to property of the United States resulting
 12 from activities carried out under the license. In no event shall
 13 a licensee be required to obtain insurance or demonstrate fi-
 14 nancial responsibility under this subparagraph in an amount
 15 which exceeds ^{either} \$100,000,000 or the maximum insurance
 available on the world market at a reasonable
 cost, whichever is less
- 16 (C) Each license issued or transferred under this Act
 17 shall require the licensee to
 enter into reciprocal waivers of claims
 with its contractors, subcontractors, and customers,
 and the contractors and subcontractors of such
 customers, involved in launch services, under which
 each party agrees to be responsible for any damage
 it sustains or for any injury to its own employees
 resulting from activities carried out under the
 license.
- 18 (D) obtain insurance,
 19 in a manner and to an extent satisfactory to the Secretary,
 20 and consistent with this section, with respect to claims by the
 21 licensee or a contractor, subcontractor, or customer of the
 22 licensee, or by a contractor or subcontractor of such custom-
 23 er, involved in providing the launch services, for death, bodily

1 injury or loss of or damage to property resulting from activities
 2 also carried out under the license.
 3 "(D) The Secretary, on behalf of the United States, may
 4 require the licensee to waive claims with respect to claims
 5 for death, bodily injury, or loss of or damage to property
 6 resulting from activities carried out under a license issued or
 7 considered under this Act."

"(D) The Secretary, on behalf of the United States, its agencies, personnel, contractors and subcontractors, shall enter into reciprocal waivers of claims with the licensee, its contractors, subcontractors and customers, and the contractors and subcontractors of such customers, involved in launch services, under which each party agrees to be responsible for any damage it sustains or for any injury to its own employees resulting from activities carried out under the license, provided, however, that any such waiver shall cover only those portions of such claims that exceed the amounts specified in subparagraphs (A) and (B) of paragraph (1), unless any such claim involves the willful misconduct or reckless disregard of the United States, in which case the United States shall waive its right to recover any damages under subparagraph (B) of paragraph (1). *financial responsibility*
 or demonstration of ability made

8 "(E) Any licensee policy obtained pursuant to a re-
 9 quirement described in paragraph (1) shall name the United
 10 States, its agencies, personnel, contractors and subcontractors
 11 the licensee, and all contractors and subcontractors of such
 12 customers, involved in providing the launch services as in-
 13 sured parties, to the extent of their potential liability, if so
 14 much to the United States.

15 "(F) The Secretary shall determine the maximum prob-
 16 able loss associated with activities under a license within 90
 17 days after a licensee has requested such a determination and
 18 has submitted all information the Secretary requires to make
 19 such a determination. The Secretary shall amend such deter-
 20 mination as warranted by new information.

21 "(G) The Secretary shall, ^{within} every 3 years after the
 22 date of the enactment of the Commercial Space Launch Act
 23 Amendments of 1987, and once every year thereafter,
 24 the revision of subparagraphs (A) and (B) of paragraph (1),
 25 and shall submit a report to the Congress which contains a

6

1 proposed adjustment to such amounts to conform with a' ed
2 liability expectations. Such proposed adjustment shall take
3 effect 30 days after the submission of such report.

4 "(b)(1) The Secretary shall provide for the payment of
5 successful claims (including reasonable expenses of litigation
6 or settlement) against the licensee, or any contractor, subcon-
7 tractor, or customer of the licensee, or any contractor or sub-
8 contractor of such customer, involved in providing launch
9 services undertaken pursuant to a license under this Act, by
10 a party other than—

11 "(A) the United States;

12 "(B) the licensee; or—

13 "(C) a contractor, subcontractor, or customer of
14 the licensee, or a contractor or subcontractor of such
15 customer, involved in providing the launch services.

"The Secretary shall provide for the payment
of successful claims (including reasonable
expenses of litigation or settlement) by a
third party against the licensee, or its
contractors, subcontractors or customers,
or the contractors or subcontractors of such
customers, resulting from activities carried
out pursuant to a license issued or transferred
under this Act for death, bodily injury

16 for death, bodily injury, or loss of or damage to property
17 resulting from activities carried out under the license, but
18 only to the extent that such claims are not compensated by
19 insurance, including self-insurance pursuant to subsection
20 (a)(1)(A)(ii). This paragraph shall not apply to claims result-
21 ing from the willful misconduct of such parties.

22 "(2) Payment of claims under paragraph (1) shall be
23 subject to—

24 "(A) notice to the United States of any claim or
25 suit against a party described in paragraph (1) for

7

1 death, bodily injury, or loss of or damage to property,

2 and

3 "(B) control of or assistance in the defense by the

4 United States, at its election, of that claim or suit.

5 "(3) The Secretary may withhold payment under para-

6 graph (1) if the Secretary certifies that the amount is not just

7 and reasonable, provided, however, that the

amount of any claim determined by the final judgment
of a court of competent jurisdiction shall be deemed by
the Secretary to be just and reasonable.

"(4) Claims under paragraph (1)(A) shall be
deemed to be claims against the United States, and
the Secretary shall pay such claims under section
1304 of title 31, United States Code."

8 ~~"(4) The Secretary shall pay such claims~~
9 ~~graph (1) in accordance with section 1304 of title 31, United~~
10 ~~States Code."~~
11 ~~under~~

Act

12 (b) Section 15(c) of the Commercial Space Launch Act
13 U.S.C. App. 3614(c) is amended to read as follows:

14 "(c) The Secretary may establish requirements for proof
15 of financial responsibility and such other assurances as may
16 be necessary to protect the United States and its agencies
17 and personnel from liability, loss, or injury as a result of a
18 launch or operation of a launch site involving Government
19 facilities or personnel. The Secretary may not under this sub-
20 section relieve the United States of liability for damage or
21 injury resulting from the reckless disregard or willful
22 negligence or intentional misconduct of
23 the United States or its agents."

24 SEC. 6 UNITED STATES LAUNCH INCENTIVES FOR CERTAIN

25 SATELLITES

(a)(1) Except as otherwise provided in this subsection,
the Secretary of Transportation shall act as insurer for any

B

1 launch involving an eligible satellite in the amount required,
2 pursuant to section 16(a)(1) (A) and (B) of the Commercial
3 Space Launch Act, for activities under a license issued under
4 such Act.

5 (2) The Administrator of the National Aeronautics and
6 Space Administration shall, upon application of the owner of
7 an eligible satellite, determine the amount such owner would
8 have been required to pay for liability insurance for third
9 party claims for the launch of such satellite under the terms
10 of the launch services agreement or contract referred to in
11 subsection (c).

12 (3) The owner of an eligible satellite shall be responsible
13 for obtaining insurance required pursuant to section 16(a)(1)
14 (A) and (B) of the Commercial Space Launch Act in an
15 amount equal to the amount determined under paragraph (2)
16 of this subsection, adjusted for inflation with respect to the
17 period between the time insurance would have been required
18 to be obtained as described in paragraph (2) and the time
19 insurance is required to be obtained pursuant to section
20 16(a)(1) (A) and (B) of the Commercial Space Launch Act.

21 ~~---(b) The Secretary of Transportation, with the coopera-~~
22 ~~tion of the Secretary of Defense and the Administrator of the-~~
23 ~~National Aeronautics and Space Administration, and in con-~~
24 ~~sultation with, and after due consideration of the interests of,~~
25 ~~the owners of eligible satellites, their launch providers, and~~

1 ~~other customers of such launch providers, shall, wherever~~
 2 ~~practicable, take steps to ensure that eligible satellites re-~~
 3 ~~ceive priority status for launch from United States launch~~
 4 ~~sites in the order in which such eligible satellites were mani-~~
 5 ~~fested by the National Aeronautics and Space Administration -~~
 6 ~~as of August 15, 1986.~~

7 ^b (c) The United States shall not require payment for the
 8 provision of launch property and launch services in connec-
 9 tion with the launch of an eligible satellite.

10 ^d (d) A satellite shall be eligible for the purposes of this
 11 section if—

12 (1) it was under construction on August 15, 1986;

13 (2) an unperformed launch services agreement or
 14 contract with the National Aeronautics and Space Ad-
 15 ministration was held with respect to it on August 15,
 16 1986; and

17 (3) it is licensed for launch under the Commercial
 18 Space Launch Act.

19 ⁷ SEC. 8. PREEMPTION OF SATELLITES.

20 Section 15(b) of the Commercial Space Launch Act (49
 21 U.S.C. App. 2614(b)) is amended by adding at the end the
 22 following new paragraph:

23 "(5)(A) The Secretary of Transportation, with the coop-
 24 eration of the Secretary of Defense and the Administrator of
 25 the National Aeronautics and Space Administration, shall

1 take steps to ensure that the launches of satellites with re-
2 spect to which a launch date commitment from the United
3 States has been obtained for a launch licensed under this Act
4 are not unreasonably preempted from access to United States
5 launch sites or property except in cases of imperative nation-
6 al need. Any determination of imperative
national need shall be made by the Secretary of the
Air Force or the Administrator of the National
Aeronautics and Space Administration and shall not
be delegated.

7 “(B) The Secretary of Transportation shall include in
8 any license issued under this Act a provision which estab-
9 lishes an amount of liquidated damages to be paid by the
10 preempting agency of the United States in the event that a
11 satellite is preempted other than as provided in subparagraph
12 (A).” Such liquidated damages shall be

paid to the licensee and/or the customer
of the licensee as the parties may agree.

13 **SEC. 7. STUDY OF PROCESS FOR SCHEDULING LAUNCHES.**

14 The Secretary of Transportation, in cooperation with
15 the Secretary of Defense and the Administrator of the Na-
16 tional Aeronautics and Space Administration, and in consul-
17 tation with representatives of the space launch and satellite
18 industry, shall study ways and means of scheduling Govern-
19 ment and commercial payloads on commercial launch vehi-
20 cles at government launch sites in a manner which—

21 (1) optimizes the use of the launch property of the
22 United States; and

23 (2) assures that the launch property of the United
24 States that is available for commercial use will be
25 available on a commercially reasonable basis.

1 consistent with the objectives of the Commercial Space
2 Launch Act. The Secretary shall submit the results of such
3 study to the Congress within 90 days after the date of the
4 enactment of this Act.

5 ⁹
6 SEC. 8. COMMERCIAL SPACE LAUNCH SERVICE COMPETITION.

7 It is the sense of the Congress that the United States
8 should explore ways and means of developing a dialogue with
9 appropriate foreign government representatives to seek the
10 development of guidelines for access to launch services by
11 satellite builders and users in a manner that assures the con-
12 duct of reasonable and fair international competition in com-
13 mercial space activities.

14 ¹⁰
15 SEC. 9. LAUNCH VEHICLE RESEARCH AND DEVELOPMENT

16 The Administrator of the National Aeronautics and
17 Space Administration shall, ^{consultation with representatives of the space launch and satellite} design a program for the support industry,
18 of research into launch systems component technologies, for
19 the purpose of developing higher performance and lower cost
20 United States launch vehicle technologies and systems avail-
21 able for the launch of commercial and Government spacecraft
22 into orbit. The Administrator shall submit a report outlining
such program to the Congress within 60 days after the date
of the enactment of this Act.

11

12

1 SEC. 79. APPLICABILITY TO LICENSES.

2 This Act, and the amendments made by this Act, shall
3 apply to all licenses issued under the Commercial Space
4 Launch Act before or after the date of the enactment of this
5 Act.

○

ASSOCIATED
AVIATION
UNDERWRITERS

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Telex: 497-4321

April 7, 1988

The Honorable Bill Nelson
Chairman, Subcommittee on Space Science
and Applications
Committee on Science, Space and
Technology
House of Representatives
Room 2324, Rayburn House Office Bldg.
Independence Avenue and S. Capitol Street, S.W.
Washington, D.C. 20515

Dear Chairman Nelson:

In response to your letter of February 12, 1988, I am pleased to submit for inclusion in the published hearing record on HR 3765 the comments and views of Associated Aviation Underwriters with respect to the issue of third party liability for commercial space launches.

We view insurers as partners with the commercial space industry and believe the industry will mature more rapidly in a free market environment such as exists in the aviation and marine insurance markets. Nevertheless, while this should be the eventual goal, we can appreciate the immediate concerns for temporary, limited government measures given the embryonic, yet highly competitive, nature of the commercial launcher market. Any such measures, however, should minimize government involvement in the claims handling process as to claims which are within coverage limits. Otherwise, we believe the willingness of insurers such as AAU to participate in third party risks will be seriously diminished.

Thank you for the opportunity to present the views of our organization on this matter of great importance to the growth of our country's commercial space industry.

Sincerely,



Daniel M. Izard
President, CEO

DMI/ck
Enclosure

cc: Ms. Lillian Trippett
Counsel to the Subcommittee

COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY
SUBCOMMITTEE ON SPACE, SCIENCE, AND APPLICATIONS
U.S. HOUSE OF REPRESENTATIVES

WRITTEN COMMENTS OF
DANIEL M. IZARD
PRESIDENT AND CEO
OF ASSOCIATED AVIATION UNDERWRITERS
REGARDING H.R. 3765

FOR INCLUSION IN THE PUBLISHED
HEARING RECORD

On behalf of Associated Aviation Underwriters, I would like to thank Congressman Nelson and the other Subcommittee members for this opportunity to comment on H.R. 3765.

Associated Aviation Underwriters, formed in 1929, is one of the oldest existing aviation groups in the United States. Some of the risks underwritten by the group include product liability for aviation manufacturers, hull and liability insurance for airlines, worker's compensation for airlines, coverage for corporately owned and operated aircraft, airport liability, and coverages for business and pleasure aircraft. In 1968, AAU participated as the lead insurer for launch coverages beginning with Comsat's Intelsat III series of launches and continued to involve itself in commercial space insurance into the early 1970's. AAU is not currently underwriting space related activities other than through its normal product liability coverages for aerospace manufacturers. However, we are looking forward to reentry into the commercial space marketplace. To the extent that we view favorably the environment within which each specific launch is made and the conditions surrounding commercial space activity in general, AAU has available a capacity of \$100,000,000 in third party liability limits per space launch. It is to promote enthusiasm for the participation of AAU and other insurers in commercial space activities that we offer the following comments:

Within the space industry, a great deal of anxiety seems to exist over the adequacy of the private insurance market to meet the needs of commercial space participants. Associated Aviation Underwriters does not

believe that the current concerns reflect the true state of affairs in insurance costs and availability. Space insurance is not wholly unlike marine and aviation insurance risks which in the very early periods presented similar challenges to the commercial insurance market. Yet, throughout their history, these risks were generally protected by private insurance contracts, even when the technology contemplated was primitive and untried. It should also be noted that the marine and aviation insurance markets are among the least regulated lines of commercial insurance in the United States. Yet, they are the markets which historically have offered consistently high limits of liability in the face of large catastrophic exposures. We believe that sufficient capacity is and will remain available for third party liability coverage for space risks. But we would suggest that the amount available will be inversely proportional to the amount of regulation exercised by governmental agencies. It is our belief that in a free market, such as the marine and aviation insurance markets, insurers are better able to participate in a broad cross section of risks. This promotes fundamental principles of insurance, such as continuity, spread of risk, and homogeneity. It also creates an environment that would provide a reasonable expectation of profit for the insurers and a more stable cost to the commercial launch marketplace. It is the expectation that losses would be spread over multiple launches with predictable outcomes in a broad, truly commercial setting, that would make this a reasonable business proposition and would encourage the widespread interest of the insurance community.

Before proceeding, I should note that the provisions in the subject

bill regarding coverage amounts and limits of liability for government property damage are not really a subject of this statement. This is for two reasons. These coverages are probably better addressed by the property insurance markets who would traditionally be involved in these areas of first-party type coverages. Secondly, we see such property coverage as a contractual matter between the Government and the users of Government property which in itself is a free market exercise.

With respect to third party liability, those provisions regarding the adequacy of insurance and the indemnity obligations of the Government, or even caps as proposed by the Administration, should in AAU's opinion be considered a temporary measure to sooth the concerns of the satellite and ELV manufacturers. We do concede the usefulness of Government involvement where the space industry sees itself in its current highly competitive yet embryonic stage. On the other hand, it must be kept in mind that the ultimate objective is to encourage growth of commercial space business. Liability caps, indemnity provisions, and artificial limits on required insurance and other non-commercial transactions will only delay the eventual maturation of the commercial side of the industry and thus the industry as a whole. I think it is extremely important to emphasize that we view insurance companies as partners in the space effort, not stumbling blocks. Insurers must be allowed to develop along with their launch partners with as little governmental restraint as possible.

Casting an eye towards claims handling, we believe that the provisions in Section 4 of H.R. 3765 (16) (b) (2) have not been scrutinized in the

hearings attendant to this Bill. The Bill states that

"(2) Payment of claims under paragraph (1) shall be subject to-

(A) notice to the United States of any claim or suit against a party described in paragraph (1) for death, bodily injury, or loss of or damage to property; and

(B) control of or assistance in the defense by the United States, at its election of that claim or suit.

These claims handling provisions will certainly have a chilling affect on the enthusiasm of space insurers to underwrite third party liability space risks. AAU understands that this language was modeled after provisions in NASA's Standard Launch Agreement. But our information is that insurers had not focused on this language when they adopted it into their original policy wording. The situation is different now. The Government's power under this provision places insurers in an insecure position. First, insurers' exposure is influenced by and in the hands of Government policy. Second, if the Government controls claims, the insurance market may not be able to achieve the continuity in claims handling necessary to develop the claims expertise to support a growing industry. As a consequence, AAU finds that more acceptable language might be modeled after the insurance provisions in the Federal Acquisition Regulations¹ to allow the commercial insurer to retain control of the

¹ The Regulation 52.228-7 (48CFR1) entitled Insurance—Liability to Third Parties states at paragraph (g):

If any suit or action is filed or any claim is made against the Contractor, the cost and expense of which may be reimbursable to the Contractor under this contract, and the risk of which is then uninsured or is insured for less than the amount claimed, the Contractor shall—

defense or settlement of claimed amounts up to the limits of coverage. In the case of claims in excess of insurance coverage limits the Government could still collaborate with and assist the insurer in the defense or settlement of the claim. And the Government could always settle on its own behalf with claimants for exposures beyond the primary insurance limits. This approach relates the control of a claim more closely to the party responsible for payment of the respective damage amounts.

In sum, AAU has great concerns over the Government's involvement and control of the claims handling process. This is a serious matter which would influence AAU's willingness to participate in third party risks. We view this prospect with trepidation and believe that our attitude reflects the concerns of insurers generally.

I sincerely appreciate the opportunity to make these brief views known on a subject which is extremely important to AAU. We believe wholeheartedly in the future and potential for growth which the space

(1) Immediately notify the Contracting Officer and promptly furnish copies of all pertinent papers received;

(2) Authorize Government representatives to collaborate with counsel for the insurance carrier in settling or defending the claim when the amount of the liability claimed exceeds the amount of coverage; and

(3) Authorize Government representatives to settle or defend the claim and to represent the Contractor in order to take charge of any litigation, if required by the Government, when the liability is not insured or covered by bond. The Contractor may, at its own expense, be associated with the Government representatives in any such claim or litigation.

industry represents. However, we also feel that the commercialization of space implies a free market approach to foster the development of this business. It is in this environment that we see the greatest potential for commercial space ventures as well as our own industry as we deal with the risk elements associated with this emerging technology.

**Marsh &
McLennan**

Marsh & McLennan
Aviation and Aerospace Services
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Washington, D.C. 20036
Telephone 202 828-7974

April 8, 1988

Ms. Lillian M. Trippett
Counsel
Committee on Science, Space and Technology
Subcommittee on Space Science and Applications
2321 Rayburn House Office Building
Washington, D.C. 20515

Re: HR3765/Industry Working Group Comments

Dear Lillian:

Daniel E. Cassidy
Vice President and Director

Per your request, I am providing the following insurance/liability related comments. These comments refer to the suggested changes to HR3765 provided to you by the "Industry Working Group" and referred to here as the "IWG Changes"

The "IWG Changes" to Sec 16(a)(1)(D) of the Commercial Space Launch Act preclude the Secretary from including United States contractors and subcontractors in reciprocal waivers within the limits of launch liability insurance. This is a hole in the mandatory cross waivers concept and allows U.S. contractors, subcontractors and their employees, as well as, their insurers in subrogation actions to bring suit against the licensee for property damage and personal injury under the launch liability insurance policy.

U.S. contractors and subcontractors, presumably, can be working and have property in close proximity to the launch site, as well as be involved in supporting U.S. activities carried out under the license. This class of person being a potential claimant, as well as an insured, is not consistent with launch liability insurance coverage specified under Sec 16(a)(1)(A).

The Secretary should have authority in determining how U.S. contractors and subcontractors' exposures to loss are handled. Legislation to this degree of detail could be inefficient and costly. Various insurance solutions are available including charging the licensee for any additional insurance costs of U.S. contractors and subcontractors, or including property of U.S. contractors and subcontractors under provisions of Sec 16(a)(1)(B).

Marsh & McLennan, Incorporated

Accordingly, the following modifications to the "IWG Changes" are provided:

Sec 4

"(12) 'Third party' means any person or entity other than the United States, its agencies, or its contractors or subcontractors, the licensee or its contractors, subcontractors, or the customer and the contractors or subcontractors of such customer, involved in launch services."

Sec 16(a)(1)(D)

"(D) The Secretary, on behalf of the United States, its agencies, personnel, contractors and subcontractors, shall enter into reciprocal waivers of claims with the licensee, its contractors, subcontractors and with the customers, and contractors and subcontractors of such customers, involved in launch services, under which each party agrees to be responsible for any damage it sustains or for any injury to its own employees resulting from activities carried out under the license, provided, however, that any such waiver shall cover only those portions of claims that exceed the amount specified in subparagraph (B) of paragraph (1), unless any such claim involves the willful misconduct or reckless disregard of the United States, in which case the United States shall waive its right to recover any damages under subparagraph (B) of paragraph (1), except that related insurance costs chargeable to the United States under its contracts or subcontracts may be chargeable as direct cost under Sec 15(b)(1).

If you have any questions, please give me a call.

Sincerely,



DC/mk
0408/7

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C. DENNIS AHEARN

April 22, 1988

Lillian Trippett, Esquire
Counsel
Subcommittee on Space Science
and Applications
Committee on Science, Space, and Technology
U.S. House of Representatives
Rayburn Building, Room 2321
Washington, D.C. 20515

Re: H.R. 4399 - Suggested Report Language Concerning
Government Preemption of Commercial Launches

Dear Ms. Trippett:

On behalf of Conatec, Inc., I would like to express our appreciation for the excellent work that has resulted in what we believe is a very good piece of legislation. This Bill will go a very long way towards resolving the most pressing issues facing the development of the commercial launch industry in our country.

There is one small addition that Conatec would like to suggest be made to the language of the Report that will accompany H.R. 4399. As a commercial provider of sounding rocket launches, Conatec will be using the launch facilities at the White Sands Missile Range ("WSMR") for the majority of its launches. Conatec has been informed by WSMR officials that it is the policy of WSMR to charge range users for use of the range even when the user is preempted by a Government launch or for other reasons of the Government, with no setoff against future range use by the preempted user. Conatec is very concerned that this can result in multiple charges for the provision of facilities or services needed only once by a commercial user. For example, if a Conatec launch is preempted at the point where Conatec has already become liable for 25% of the cost of the range use and must have the same services performed again for a rescheduled launch, Conatec's total cost for use of the WSMR range will be 125% of the normal charge. Such a policy means that Conatec cannot plan

- 2 -

with certainty what its costs for use of the WSMR will be, and may subject Conatec to much higher costs than it had anticipated.

Conatec thus respectfully requests that language be added to the H.R. 4399 Committee Report to indicate that it is the policy of the United States to charge a commercial user of launch range facilities only once for the use of particular facilities or services when a Government preemption of a launch requires that such facilities or services be furnished more than once. Since Section 6 of H.R. 4399 deals only with satellite launches, it is suggested that such language not be specifically attached to that section but be placed in the general comments section of the Report to make it clear that suborbital launches are meant to be included in this policy. We suggest that language similar to the following be included:

"During consideration of this Bill, a potential concern was expressed about the charges that might be incurred by a commercial user of Government launch facilities or services in the event that the Government preempted a launch. The concern was that a commercial user needing the provision of certain Government launch facilities or services only once to accomplish its launch might be charged a second time for the provision of the same facilities or services even though it was the Government preemption of the launch that made such duplication necessary. The Committee wants to make it clear that the Government should not be in a position to charge a commercial user more for the use of launch facilities or services by preempting a commercial launch than it would have been able to charge if the launch had not been preempted. Therefore, in furtherance of the intentions and goals of the Commercial Space Launch Act, it is the policy of the United States that the total charges incurred by a commercial user for the provision of Government launch facilities or services in support of a particular commercial launch shall be the amount that would have been charged the user in the event that Government preemption(s) of that launch had not occurred."

Once again, our thanks for a job well done. Please call me if I may be of any further assistance in this matter.

Sincerely,

Dennis

C. Dennis Ahearn

APPENDIX 6

IB

Union Calendar No. 377

100TH CONGRESS
2D SESSION**H. R. 4399**

[Report No. 100-639]

To facilitate commercial access to space, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

APRIL 18, 1988

Mr. NELSON of Florida (for himself, Mr. ROE, Mr. LUJAN, Mr. WALKER, Mr. BROWN of California, Mr. PACKARD, Mr. VOLKMER, Mr. SMITH of New Hampshire, Mr. MINETA, Mr. SLAUGHTER of Virginia, Mr. TORRICELLI, Mr. KONNYU, Mr. TRAFICANT, Mr. BUECHNER, Mr. CHAPMAN, Mr. HEFLEY, Mr. PERKINS, Mrs. MORELLA, Mr. McMILLEN of Maryland, Mr. LEWIS of Florida, Mr. NAGLE, Mr. HAYES of Louisiana, Mr. HALL of Texas, Mr. MACKAY, Mr. SKAGGS, Mr. NOWAK, Mr. LAGOMARSINO, Mr. SENSENBRENNER, Mrs. LLOYD, and Mr. SCHEUER), introduced the following bill; which was referred to the Committee on Science, Space, and Technology

MAY 19, 1988

Committed to the Committee of the Whole House on the State of the Union and ordered to be printed

A BILL

To facilitate commercial access to space, and for other purposes.

- 1 *Be it enacted by the Senate and House of Representa-*
- 2 *tives of the United States of America in Congress assembled,*

1 **SECTION 1. SHORT TITLE; FINDINGS.**

2 (a) This Act may be cited as the "Commercial Space
3 Launch Act Amendments of 1988".

4 (b) The Congress finds that—

5 (1) a United States commercial space launch in-
6 dustry is an essential component of national efforts to
7 assure access to space for Government and commercial
8 users;

9 (2) the Federal Government should encourage, fa-
10 cilitate, and promote the use of the United States com-
11 mercial space launch industry in order to continue
12 United States aerospace preeminence;

13 (3) the United States commercial space launch in-
14 dustry must be competitive in the international market-
15 place;

16 (4) Federal Government policies should recognize
17 the responsibility of the United States under interna-
18 tional treaty for activities conducted by United States
19 citizens in space; and

20 (5) the United States must maintain a competitive
21 edge in international commercial space transportation
22 by ensuring continued research in launch vehicle com-
23 ponent technology and development.

24 **SEC. 2. DEFINITION.**

25 Section 4 of the Commercial Space Launch Act (49
26 U.S.C. App. 2603) is amended—

1 (1) at the end of paragraph (10), by striking
2 "and";

3 (2) by redesignating paragraph (11) as paragraph
4 (12); and

5 (3) by inserting after paragraph (10) the following
6 new paragraph:

7 "(11) 'third party' means any person or entity
8 other than—

9 (A) the United States, its agencies, its per-
10 sonnel involved in launch services, or its contrac-
11 tors or subcontractors involved in launch services;

12 (B) the licensee;

13 (C) the licensee's contractors, subcontrac-
14 tors, or customers involved in launch services; or

15 (D) any such customer's contractors or sub-
16 contractors involved in launch services; and".

17 **SEC. 3. DEFINITION OF DIRECT COSTS.**

18 (a) Section 15(b)(1) of the Commercial Space Launch
19 Act (49 U.S.C. App. 2614(b)) is amended by inserting at the
20 end the following: "For purposes of this paragraph, the term
21 'direct costs' means the actual costs that can be unambig-
22 uously associated with a commercial launch effort, and would
23 not be borne by the United States Government in the ab-
24 sence of a commercial launch effort."

1 (b) Section 15(a) of the Commercial Space Launch Act
2 (49 U.S.C. App. 2614(a)) is amended by adding at the end
3 the following new sentence: "In taking such actions, the Sec-
4 retary shall take into account the commercial availability on
5 reasonable terms and conditions of substantially equivalent
6 launch property or launch services from a domestic source."

7 (c) Section 15 of the Commercial Space Launch Act (49
8 U.S.C. App. 2614) is amended by adding at the end the fol-
9 lowing new subsection:

10 "(d) For the purposes of this section, launch services
11 shall include activities involved in the preparation or produc-
12 tion of a launch vehicle and its payload for launch and the
13 conduct of a launch."

14 **SEC. 4. INSURANCE REQUIREMENTS OF LICENSEE.**

15 (a) Section 16 of the Commercial Space Launch Act (49
16 U.S.C. App. 2615) is amended by striking "SEC. 16." and all
17 that follows through "other appropriate agencies." and in-
18 serting in lieu thereof the following:

19 "SEC. 16. (a)(1)(A) Each license issued or transferred
20 under this Act shall require the licensee—

21 "(i) to obtain liability insurance; or

22 "(ii) to demonstrate financial responsibility
23 in an amount sufficient to compensate the maximum probable
24 loss, as determined by the Secretary, from claims by a third
25 party for death, bodily injury, or loss of or damage to proper-

1 ty resulting from activities carried out under the license. In
2 no event shall a licensee be required to obtain liability insur-
3 ance or demonstrate financial responsibility under this sub-
4 paragraph in an amount which exceeds either \$500,000,000
5 or the maximum liability insurance available on the world
6 market at a reasonable cost, whichever is less.

7 “(B) Each license issued or transferred under this Act
8 shall require the licensee—

9 “(i) to obtain insurance; or

10 “(ii) to demonstrate financial responsibility
11 in an amount sufficient to compensate the maximum probable
12 loss, as determined by the Secretary, from claims against any
13 party by the United States for loss of or damage to property
14 of the United States resulting from activities carried out
15 under the license. In no event shall a licensee be required to
16 obtain insurance or demonstrate financial responsibility under
17 this subparagraph in an amount which exceeds either
18 \$100,000,000 or the maximum insurance available on the
19 world market at a reasonable cost, whichever is less.

20 “(C) Each license issued or transferred under this Act
21 shall require the licensee to enter into reciprocal waivers of
22 claims with its contractors, subcontractors, and customers,
23 and the contractors and subcontractors of such customers,
24 involved in launch services, under which each party agrees to
25 be responsible for any damage it sustains or for any injury to

1 its own employees resulting from activities carried out under
2 the license.

3 “(D) The Secretary, on behalf of the United States, its
4 agencies, personnel involved in launch services, and contrac-
5 tors and subcontractors involved in launch services, shall
6 enter into reciprocal waivers of claims with the licensee, its
7 contractors, subcontractors, and customers, and the contrac-
8 tor and subcontractors of such customers, involved in launch
9 services, under which each party agrees to be responsible for
10 any damage it sustains or for any injury to its own employees
11 resulting from activities carried out under the license. Any
12 such waiver shall apply only to the extent that claims exceed
13 insurance or self-insurance pursuant to subparagraph (B),
14 unless any such claim involves the willful misconduct or reck-
15 less disregard of the United States, in which case the United
16 States shall waive its right to recover any damages under
17 subparagraph (B).

18 “(2) Any insurance policy obtained or demonstration of
19 financial responsibility made pursuant to a requirement de-
20 scribed in paragraph (1) shall protect the United States, its
21 agencies, personnel, contractors, and subcontractors, and all
22 contractors, subcontractors, and customers of the licensee,
23 and all contractors and subcontractors of such customers, in-
24 volved in providing the launch services, to the extent of their
25 potential liabilities, at no cost to the United States.

1 “(3) The Secretary shall determine the maximum proba-
2 ble loss associated with activities under a license within 90
3 days after a licensee has requested such a determination and
4 has submitted all information the Secretary requires to make
5 such a determination. The Secretary shall amend such deter-
6 mination as warranted by new information.

7 ~~“(4)~~ The Secretary shall, within 3 years after the date
8 of the enactment of the Commercial Space Launch Act
9 Amendments of 1988, and once every year thereafter, review
10 the amounts specified in the last sentence of subparagraphs
11 (A) and (B) of paragraph (1), and shall submit a report to the
12 Congress which contains a proposed adjustment to such
13 amounts to conform with altered liability expectations and
14 worldwide availability of insurance. Such proposed adjust-
15 ment shall take effect 30 days after the submission of such
16 report.

17 “(b)(1) The Secretary shall provide for the payment of
18 successful claims (including reasonable expenses of litigation
19 or settlement) by a third party against the licensee, or its
20 contractors, subcontractors, or customers, or the contractors
21 or subcontractors of such customers, resulting from activities
22 carried out pursuant to a license issued or transferred under
23 this Act for death, bodily injury, or loss of or damage to
24 property, but only to the extent that such claims are not
25 compensated by insurance, including self-insurance pursuant

1 to subsection (a)(1)(A)(ii). This paragraph shall not apply to
2 claims resulting from the willful misconduct of such parties.

3 “(2) Payment of claims under paragraph (1) shall be
4 subject to—

5 “(A) notice to the United States of any claim or
6 suit against a party described in paragraph (1) for
7 death, bodily injury, or loss of or damage to property;
8 and

9 “(B) control of or assistance in the defense by the
10 United States, at its election, of that claim or suit.

11 “(3) The Secretary may withhold payment under para-
12 graph (1) if the Secretary certifies that the amount is not just
13 and reasonable, except that the amount of any claim deter-
14 mined by the final judgment of a court of competent jurisdic-
15 tion shall be deemed by the Secretary to be just and reasona-
16 ble.

17 “(4) Claims under paragraph (1) shall be deemed to be
18 claims against the United States, and the Secretary shall pay
19 such claims under section 1304 of title 31, United States
20 Code.”.

21 (b) Section 15(c) of the Commercial Space Launch Act
22 (49 U.S.C. App. 2614(c)) is amended to read as follows:

23 “(c) The Secretary may establish requirements for proof
24 of financial responsibility and such other assurances as may
25 be necessary to protect the United States and its agencies

1 and personnel from liability, loss, or injury as a result of a
2 launch or operation of a launch site involving Government
3 facilities or personnel. The Secretary may not under this sub-
4 section relieve the United States of liability for damage or
5 injury resulting from the reckless disregard or willful miscon-
6 duct of the United States or its agents.”.

7 SEC. 5. UNITED STATES LAUNCH INCENTIVES FOR CERTAIN
8 SATELLITES.

9 (a) The requirements of section 16(a)(1)(B) of the Com-
10 mercial Space Launch Act shall not apply to eligible satel-
11 lites.

12 (b) The United States shall not require payment from
13 the licensee or customer of the licensee for the provision of
14 launch property, launch services, or launch sites required in
15 connection with the commercial launch of an eligible satellite.

16 (c) A satellite shall be eligible for the purposes of this
17 section if—

18 (1) it was under construction on August 15, 1986;

19 (2) an unperformed launch services agreement or
20 contract with the National Aeronautics and Space Ad-
21 ministration was held with respect to it on August 15,
22 1986; and

23 (3) it is licensed for launch under the Commercial
24 Space Launch Act.

1 **SEC. 6. PREEMPTION OF SATELLITES.**

2 Section 15(b) of the Commercial Space Launch Act (49
3 U.S.C. App. 2614(b)) is amended by adding at the end the
4 following new paragraph:

5 “(4)(A) The Secretary of Transportation, with the coop-
6 eration of the Secretary of Defense and the Administrator of
7 the National Aeronautics and Space Administration, shall
8 take steps to ensure that the launches of satellites with re-
9 spect to which a launch date commitment from the United
10 States has been obtained for a launch licensed under this Act
11 are not preempted from access to United States launch sites
12 or property except in cases of imperative national need. Any
13 determination of imperative national need shall be made by
14 the Secretary of the Air Force or the Administrator of the
15 National Aeronautics and Space Administration and shall not
16 be delegated.

17 “(B) The Secretary of the Air Force or the Administra-
18 tor of the National Aeronautics and Space Administration, as
19 the case may be, shall report to the Congress within 7 days
20 after any determination of imperative national need under
21 subparagraph (A), including a full explanation of the circum-
22 stances justifying such determination and a schedule for en-
23 suring the prompt launching of a preempted satellite.”

24 **SEC. 7. STUDY OF PROCESS FOR SCHEDULING LAUNCHES.**

25 The Secretary of Transportation, in cooperation with
26 the Secretary of Defense and the Administrator of the Na-

1 tional Aeronautics and Space Administration, and in consul-
2 tation with representatives of the space launch and satellite
3 industry, shall study ways and means of scheduling Govern-
4 ment and commercial payloads on commercial launch vehi-
5 cles at government launch sites in a manner which—

6 (1) optimizes the use of the launch property of the
7 United States; and

8 (2) assures that the launch property of the United
9 States that is available for commercial use will be
10 available on a commercially reasonable basis,
11 consistent with the objectives of the Commercial Space
12 Launch Act. The Secretary shall submit the results of such
13 study to the Congress within 120 days after the date of the
14 enactment of this Act.

15 **SEC. 8. COMMERCIAL SPACE LAUNCH SERVICE COMPETITION.**

16 It is the sense of the Congress that the United States
17 should explore ways and means of developing a dialogue with
18 appropriate foreign government representatives to seek the
19 development of guidelines for access to launch services by
20 satellite builders and users in a manner that assures the con-
21 duct of reasonable and fair international competition in com-
22 mercial space activities.

23 **SEC. 9. LAUNCH VEHICLE RESEARCH AND DEVELOPMENT.**

24 The Administrator of the National Aeronautics and
25 Space Administration, in consultation with representatives of

1 the space launch and satellite industry, as appropriate, shall
2 support research into launch systems component technol-
3 ogies, for the purpose of developing higher performance and
4 lower cost United States launch vehicle technologies and sys-
5 tems available for the launch of commercial and Government
6 spacecraft into orbit. The Administrator shall submit a report
7 outlining such activities to the Congress within 120 days
8 after the date of the enactment of this Act.

9 SEC. 10. APPLICABILITY TO LICENSES.

10 This Act, and the amendments made by this Act, shall
11 apply to all licenses issued under the Commercial Space
12 Launch Act before or after the date of the enactment of this
13 Act.